May/1960

- *A new device for determining chocolate temper*

PMCA Production Conference

- *Impact of cocoa bean quality on chocolate products*
- *The function of low conversion corn syrup in hard candies*

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# MC the Manufacturing Confectioner

specialized publication for confectionery manufacturers

**SHULTON NUVAN** creates a full range of vanilla effects . . . at a much lower cost than vanillin. Nuvan is a standardized mixture of Shulton Vanitrope® and Shulton Vanillin USP . . . offering up to four times the flavor strength of vanillin alone*

Both Shulton Vanitrope and Shulton Vanillin . . . blended in Nuvan under laboratory control . . . have been widely accepted—for **CHOCOLATE—BAKED GOODS—CANDY—EXTRACTS—ICE CREAM—PUDDINGS.**

Samples and technical bulletins available on request.

*Nuvan 17—*4 times the flavor strength of vanillin.* Nuvan 120—*2 times the flavor strength of vanillin.*

**SHULTON FINE CHEMICALS**

DIVISION OF

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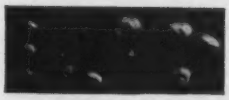
# THERE IS NOTHING QUITE LIKE

**the nutty-rich flavor and crunchy texture**

# CALIFORNIA'S BLUE DIAMOND BRAND ALMONDS

**add to**  **bars and box candy**

# THESE ARE CALIFORNIA'S FINEST ALMONDS

**– scientifically grown and double-sorted to assure top quality**

# YOUR BEST WAY TO ADD PREMIUM QUALITY

**at low cost is to add BLUE DIAMOND BRAND almonds**

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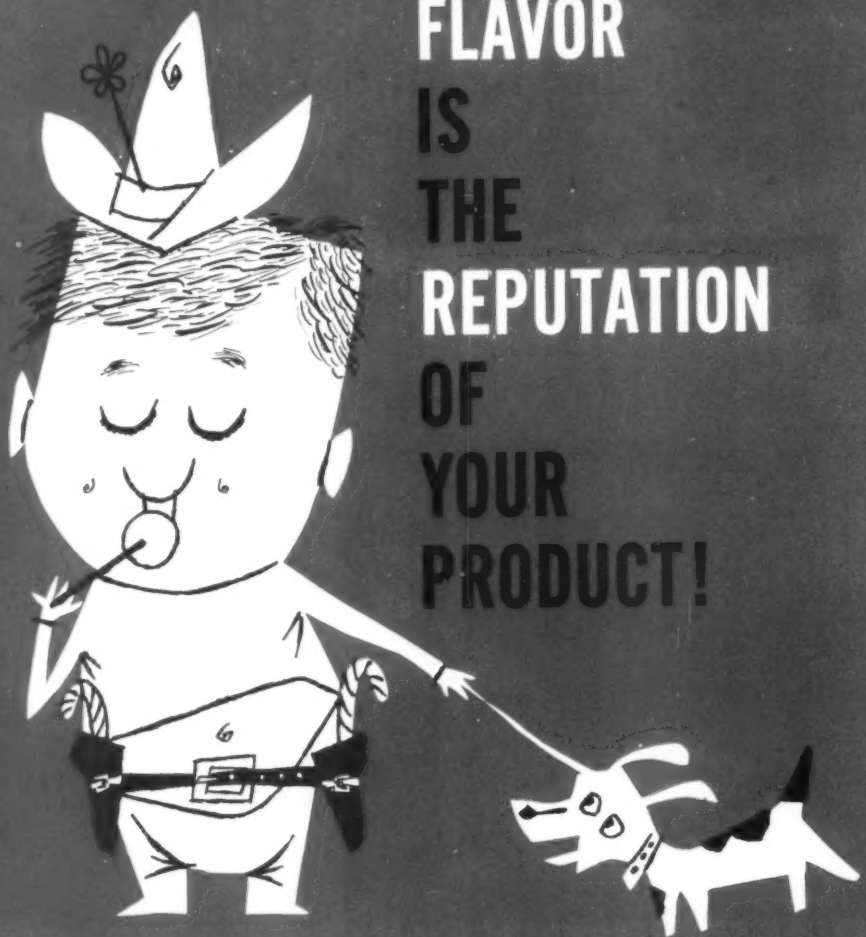
Sales Office: 75-35 31st Avenue, East Elmhurst 70, Long Island

# YOUR CANDY FLAVOR IS THE REPUTATION OF YOUR PRODUCT!



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## Dr. Langwill to receive Stroud Jordan award

Katheryn E. Langwill

Dr. Katheryn E. Langwill, director of research of Refined Syrups & Sugars, Inc., will be the tenth recipient of the Stroud Jordan Award to be presented at the annual meeting of the American Association of Candy Technologists on June 6th in Philadelphia. A newly designed scroll will be presented to Dr. Langwill along with the bronze medal, and to the nine previous recipients of the Award: Otto H. Windt, Horace B. Cosler, Norman W. Kempf, John M. Krno, C. Rudolph Kroekel, Justin J. Alikonis, Hans F. Dresel, James P. Booker, and James A. King.

Dr. Langwill is well known in the field for her work with the late Dr. Stroud Jordan as co-author with him of "Confectionery Analysis and Composition" a book containing their efforts in the area of re-construction of candy formulae from analytical data and comparative studies of various types of confections. While studying for her Ph.D. at Columbia she served as technical editor of *The Manufacturing Confectioner* and has since that time contributed many articles to this and other industry publications. Dr. Langwill is author of the section on confectionery published in the Encyclopedia of Chemcial Technology and contributed the chapter on "Confections in the Diet" to the National Confectioners' Association book "All About Candy and Chocolate."

The Stroud Jordan medal is presented through the cooperation of the American Sugar Refining Co. and the American Association of Candy Technologists to the person who has stimulated interest in, and made outstanding contributions to the field of candy technology.

## Tootsie Roll ice cream

The Sweets Company of America has introduced Tootsie Roll Ice Cream Bars manufactured and nationally distributed under license agreements with leading ice cream manufacturers. The bar is composed of Tootsie Roll flavored ice cream covered with Tootsie Roll flavored chocolaty coating. No problems have been encountered with the blending of the Tootsie Roll flavor with ice cream mix and production runs have been free of difficulties in this area.

## Feb. 1960 sales up 5%

Figures for February 1960 show a 5% increase over February 1959 sales but the change between the first two months of 1959 and the first two months of 1960 is less than 0.5 percent. Chocolate manufacturers report a 16% increase over February 1959 and a 9% increase for the first two months.

Five and ten cent specialties showed a gain of 16% pound-wise and 20% value-wise for the first two months of 1960, while package goods at less than a dollar a pound were off 31% in the dollar column and 29% in poundage.

| Item | Estimated sales of current month and comparison | | Estimated sales year to date | |
|---|---|---|---|---|
| | Feb. 1960 ($1,000) | Feb. 1960 from Feb. 1959 | 2 months 1960 ($1,000) | Percent change from 2 months 1959 |
| Confectionery and competitive chocolate products, estimated total... | 107,297 | +5 | 208,996 | (2) |
| BY KIND OF BUSINESS: | | | | |
| Manufacturer-wholesalers ..... | 82,855 | +3 | 165,779 | −2 |
| Manufacturer-retailers[1] ..... | 9,531 | +2 | 15,086 | (2) |
| Chocolate manufacturers ..... | 14,911 | +16 | 28,131 | +9 |
| TOTAL ESTIMATED SALES OF MANUFACTURER-WHOLESALERS BY DIVISION AND STATES | | | | |
| New England ..... | 9,083 | +8 | 19,387 | +2 |
| Middle Atlantic ..... | 26,713 | +6 | 52,609 | −4 |
| N. Y. and N. J. ..... | 14,675 | +2 | 27,026 | −6 |
| Pa. ..... | 12,038 | +10 | 25,583 | −1 |
| East North Central ..... | 31,183 | +3 | 60,074 | −2 |
| Ill. ..... | 27,535 | +1 | 52,914 | −4 |
| Ohio and Ind. ..... | 2,291 | +33 | 4,324 | +39 |
| Mich. and Wis. ..... | 1,357 | −1 | 2,836 | −11 |
| West North Central ..... | 3,381 | +1 | 6,763 | +4 |
| Minn., Kan., S. Dak., and Neb. | 1,994 | −2 | 4,159 | +5 |
| Iowa and Mo. ..... | 1,387 | +5 | 2,604 | +4 |
| South Atlantic ..... | 3,352 | −6 | 7,289 | −1 |
| Md., D. of C., Va., W. Va., N. Car., and S. Car. ..... | 1,715 | −1 | 3,357 | +2 |
| Ga. and Fla. ..... | 1,637 | −11 | 3,932 | −4 |
| East South Central: Ky., Tenn., Ala., and Miss. .... | 1,754 | +1 | 3,330 | −7 |
| West South Central: Ark., La., Okla., and Tex. .... | 2,339 | −1 | 5,797 | +4 |
| Mountain: Ariz., Colo., Idaho, N. Mex., and Utah ..... | 837 | −3 | 1,773 | (2) |
| Pacific ..... | 4,213 | −4 | 8,757 | +2 |
| Calif. ..... | 3,490 | −4 | 6,930 | +2 |
| Wash. and Ore. ..... | 723 | −3 | 1,827 | +4 |

[1]Retailers with two or more outlets.
[2]Less than 0.5 percent change.

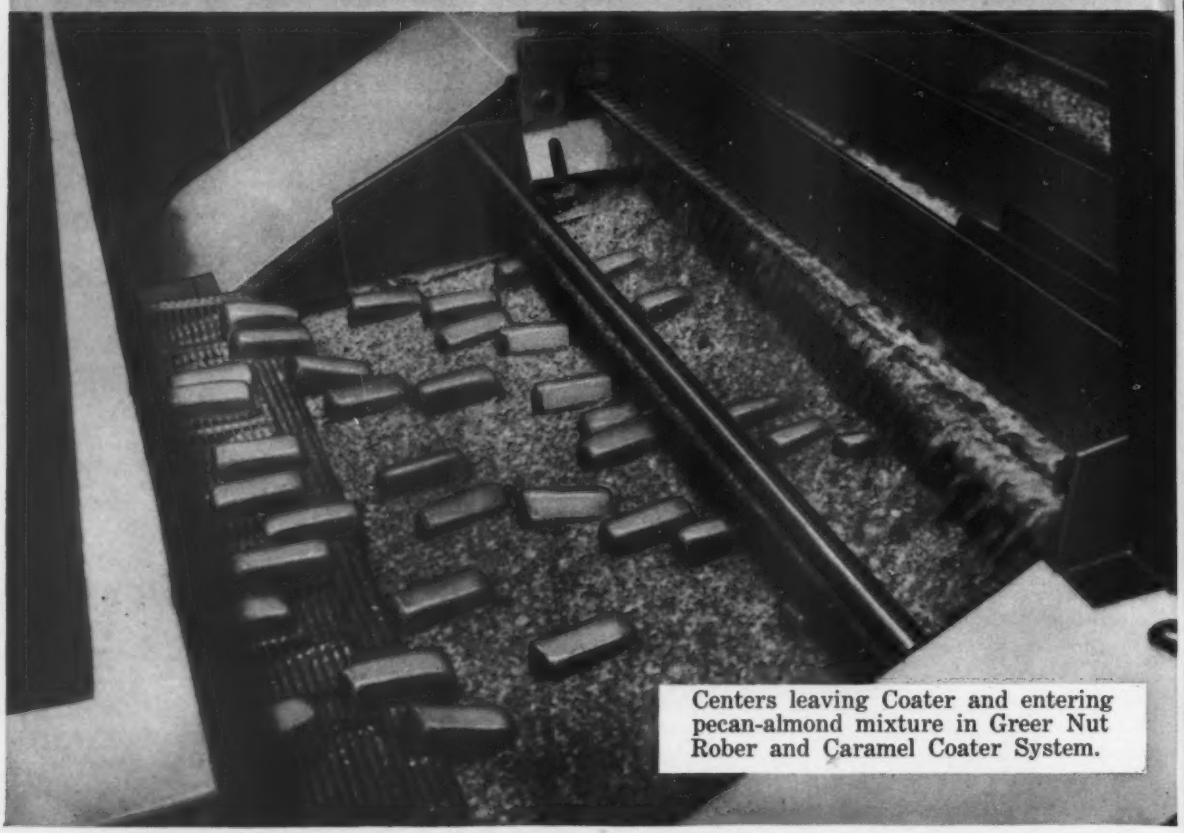
| Type of product[1] | February 1960 Pounds (1,000) | February 1960 Value ($1,000) | First 2 months Pounds (1,000) 1960 | First 2 months Pounds (1,000) Percent change from 1959 | First 2 months Value ($1,000) 1960 | First 2 months Value ($1,000) Percent change from 1959 |
|---|---|---|---|---|---|---|
| TOTAL SALES OF SELECTED ESTABLISHMENTS | 117,105 | 48,022 | 227,739 | −4 | 97,169 | −4 |
| Package goods made to retail at: | | | | | | |
| $1.00 or more per lb. | 3,678 | 3,839 | 10,490 | +3 | 13,081 | +3 |
| $.50 to $.99 per lb. | 9,154 | 4,975 | 17,280 | −29 | 9,334 | −31 |
| Less than $.50 per lb. | 17,037 | 4,493 | 31,687 | −14 | 8,327 | −15 |
| Bar goods ..... | 57,003 | 23,945 | 108,611 | −1 | 45,666 | −1 |
| 5¢ and 10¢ specialties | 12,634 | 5,853 | 23,908 | +16 | 10,944 | +20 |
| Bulk goods[2] ..... | 17,599 | 4,917 | 35,763 | ... | 9,817 | −1 |

[1]Selected group of large manufacturer-wholesalers and chocolate manufacturers report sales by type of product. Companies reporting such detail account for approximately half of the total dollar sales of manufacturers.
[2]Includes penny goods.

Data from monthly *"Current Industrial Reports"* of the U. S. Department of Commerce.

Published monthly by The Manufacturing Confectioner Publishing Company. Executive offices: 418 North Austin Boulevard, Oak Park, Illinois. Telephone Village 8-6810. Eastern Offices: Box 115, Glen Rock, New Jersey. N. Y. City telephone Bowling Green 9-8976. Publication Offices: 1309 N. Main Street, Pontiac, Illinois. Copyright, 1960, Prudence W. Allured. All rights reserved. Second-class mail privileges authorized at Pontiac, Illinois.

# GREER IDEAS
## produce a better way...



Centers leaving Coater and entering pecan-almond mixture in Greer Nut Rober and Caramel Coater System.

## ...for NUT ROLL PROCESSING

Greer ingenuity has done it again . . . produced a highly versatile automatic method for manufacturing nut rolls. The new Greer Nut Rober and Caramel Coater opens up a complete new area of production and often pays for itself in months.

This is the only automatic approach to nut roll manufacture ever developed. It requires ¼th the labor, ¼th the time of the old, hand-production method. While increasing product quality, uniformity and control, the new Greer system lowers labor and production costs.

The Nut Rober and Caramel Coater handles a wide variety of granular materials plus an equally wide range of coatings. It features continuous high production (6-10 ft. per minute), maintains finest caramel quality. The entire system can be installed in two days, and machine cleaning takes only 30 minutes. At present, nine leaders in the candy industry are taking advantage of this unique new system. We'll gladly send you details.

*Call or write* **J. W. GREER COMPANY**
Wilmington, Massachusetts
BOSTON • NEW YORK • CHICAGO • SAN FRANCISCO
European Representatives: Bramigk and Company,
15 Creechurch Lane, London E. C. 3, England

GREER

**...TO BRING BETTER FOOD TO MORE PEOPLE AT LOWER COST**

## Russell Stover sold

Announcement has been made of the plan to sell Russell Stover Candy Co. of Kansas City to the Ward-Murfin Corporation for about seven million dollars in cash. Details of the sale are expected to be completed in another month but it is reported that there will be no change in management personnel.

## Salesmen plan united association

The Candy Salesmen's Council of America has retained Fairbanks Associates, management consultants, to work out a method of membership services and benefits which will prove satisfactory to both the National Confectionery Salesmen's Association and the Western Confectionery Salesmen Association. Robert C. Hibben of Fairbanks' staff has been instructed to produce specific plans for a national association of confectionery manufacturers' representatives which will have as membership only brokers and direct company salesmen whose principal source of income is from selling confectionery.

Mr. Hibben has worked as special trade association counsel for the National Candy Wholesalers Association and was for 25 years the executive secretary of the International Association of Ice Cream Manufacturers.

Report on his plan will be heard at the Council's next meeting in Washington, D. C. June 23-24. The Council has indicated, however, that it plans to produce a paid secretary within a short time to serve on the joint committee on public relations for the candy industry and has passed a resolution asking for full representation on this committee for the manufacturers' representatives' branch of the industry.

## Candy package wins award

The package for Chocolate Pecan Fancies manufactured by Dressel's Bakeries of Chicago, Illinois, received the first award in the lithography category for superiority of printing at the 1960 Folding Carton Competition sponsored by the Folding Paper Box Association of America. In the confection category no first award was presented. Judges expressed disapproval of the general quality of candy packages which were represented in the competition and presented a single merit award in this category to an ice cream package.

## CMA elects officers

The Chocolate Manufacturers Association of the U.S.A. elected L. W. Majer of the Hershey Chocolate Company, president at its annual meeting on April 19th in New York City. John Woodward of Klein Chocolate Company was elected vice president and Bradshaw Mintener will continue as executive director. The members of the Association voted in favor of supporting the public relations program which has been set-up for entire industry participation, and voted in favor of a proposal from its Technical Committee to finance basic research into problems of cocoa and chocolate.

## AACT honors Norman Kempf

The Boston Section of the American Association of Candy Technologists has presented a sterling silver Paul Revere bowl to Norman Kempf in recognition of his contributions to candy technology over the years. Mr. Kempf is retiring on July 1 as chocolate manufacturing consultant of the Walter Baker Division of General Foods and will enter business as a consultant to the industry.

## Cincinnati firm names VP

Norman S. Beatty, former candy production superintendent of The Kroger Company, has been appointed vice-president and general manager of Putman's Candies, 2415 Boudinot Avenue, Cincinnati, Ohio.

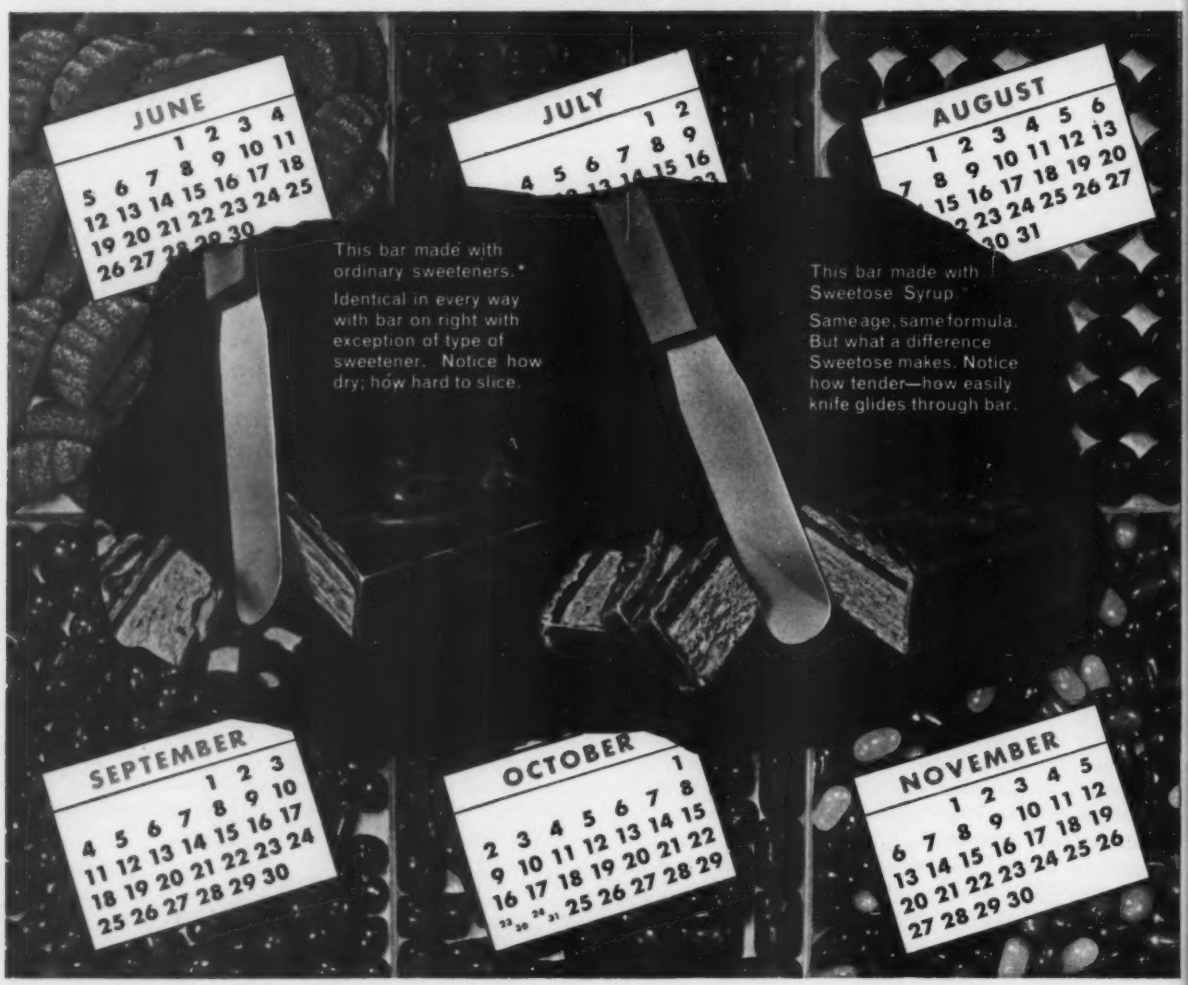
## New ad manager at Gold Medal

Marvin H. Robins has been named advertising and merchandising manager of Gold Medal Candy Corporation. Mr. Robins will direct the launching of several new products later this year and early in 1961, and will also supervise a program of package redesign.

## See's stock sale successful

See's Candy Shops, Inc. selling 250,832 shares of common stock in a public offering had all shares spoken for a short time after it was placed on the market. Selling at $11 a share the stock was sold for the account of Laurance A. See and Charles B. See the principal stockholders, who retain 75% voting control of the company.

# Cut a slice...see, feel, taste the BIG difference Sweetose® makes


JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
This bar made with ordinary sweeteners.*
Identical in every way with bar on right with exception of type of sweetener. Notice how dry; how hard to slice.
This bar made with Sweetose Syrup.
Same age, same formula. But what a difference Sweetose makes. Notice how tender—how easily knife glides through bar.

## Here's proof positive candies made with Sweetose Syrup look better, taste fresh and delicious—even after long periods in distribution channels

*Make this revealing taste and freshness test in your own plant—with your own candies*

***See the difference in texture.*** **A smoother, tenderer texture free of graininess. A richer, more appetizing appearance.**

***Feel the difference in freshness.*** **Bars stay fresh, never too dry because Sweetose controls moisture balance under all climate conditions.**

***Taste the difference in flavor.*** **A delicious "buy-me-again" flavor with never a hint of staleness even after long time periods.**

Whether you make gums, jellies, caramels, fudges or bars—don't fail to make this simple test. It proves candies made with Sweetose Syrup retain their original freshness and flavor long after candies made with regular sweeteners "go stale on the shelf."

What's the secret? The narrow humectant range of Sweetose Syrup assures controlled moisture balance through a wide range of climatic conditions...actually "humidity-conditions" candies.

Your Staley Representative will supply you with the instructions and Sweetose Syrup to make this simple test in your own plant. Prove for yourself that candies—your candies, when made with Sweetose, will look better, taste better—stay fresh and delicious even after extended periods in storage and distribution channels.

**Regular corn syrup, invert sugars and/or other humectant-sweeteners.*

A. E. STALEY MFG. CO., DECATUR, ILLINOIS

Sweetose®

THE ORIGINAL ENZYME-CONVERTED CORN SYRUP

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WHITE PLAINS, N. Y.

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IN ALL THE WORLD, THERE ARE NO FINER FLAVORS — AS A GROUP AND FOR THE PURPOSES INTENDED — THAN THESE!

FIFTY DIFFERENT FLAVORING EFFECTS are offered in this much imitated group of powerful, non-alcoholic, high-cook flavors. They are invaluable for use in hard candies, gums and jellies. Since they contain no water or alcohol, they are freely soluble in vegetable oils and therefore provide delicious effects in bon bon and summer confectionery coatings, sandwich fillings and oil base icings. Write for our catalog and/or samples.

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## Wolflisberg chairman PR finance

Hans J. Wolflisberg, president of The Nestle Company, Inc., has accepted the chairmanship of the National Finance Committee of the new industry-wide public relations program. The Finance Committee hopes to obtain pledges totaling $750,000 for the three year program and aims at having the majority of pledges in before the National Confectioners Association Convention, June 5-9.

## Technologists open NCA convention

The annual joint meeting of the American Association of Candy Technologists and the National Confectioners Association will open the 77th NCA convention on June 6th in Philadelphia's Convention Hall. Food additives, quality control, confectionery fats and sanitation will be the topics covered by speakers and group discussion. Lawrence L. Rowe, chief chemist, H. B. Reese Candy Co. will speak on "Quality Control for the Small Manufacturer." Attorney Michael F. Markel, Markel & Hill, Washington, D. C. will cover the topic "The Food Additives Amendment and Labeling Requirements as Applied to Confections." R. O. Feuge of the Southern Utilization Research and Development Division of the U. S. Department of Agriculture will report on research on confectionery fats and Gerald S. Doolin, director of the NCA's research and sanitation program will address the group on the subject "Attitudes on Sanitation." Moderator for the group discussions will be George Thompson, Vernell-Thompson Candy Co., Seattle, chairman of NCA's research committee.

## New sales manager at Chunky

Al Hasenberg has been appointed sales manager of Chunky Chocolate Corporation with sales responsibility for all Chunky and Schutter products. Mr. Hasenberg joined the company in 1955 as assistant sales manager.

## Candy companies using more TV

The Television Bureau of Advertising has released figures on 1959 use of network and spot television by confectionery manufacturers which show a gross billing increase of 23.6% over 1958 figures. The top spender in network TV was Beech Nut-Life Savers and Wm. Wrigley, Jr. Co. spent the most in spot TV. Other companies who comprised the top ten confectionery firms on television were American Chicle Co., Food Manufacturers, Inc., The Sweets Co. of America, Mars, Inc., Peter Paul, Inc., Hollywood Brands, New England Confectionery Co. and Chunky Chocolate Corp. The industry spent a gross total of $26,201,966 in 1959 and the Television Bureau predicts a much higher figure for 1960.

## FTC chief keynotes convention

Earl W. Kintner, chairman of the Federal Trade Commission, will address the opening luncheon meeting of the National Confectioners Association Convention on Tuesday, June 7th at the Bellevue-Stratford Hotel in Philadelphia. Mr. Kintner who spearheaded a stepped-up Federal drive against violations of the Robinson-Patman Act is expected to deliver a hard-hitting message.

## In-store research available

A Philadelphia advertising agency is offering opportunities to test lables, pricing, packaging, displays, etc. to food manufacturers through what they call a "chain supermarket laboratory". The agency, Marketing and Advertising Associates, Penn Square Building, Philadelphia 7, has made arrangements with the Wrigley division of ACF-Wrigley, leading Michigan food chain, to set-up a scientific method to measure sales techniques under actual in-store selling condititions. The agency is also negotiating with several other large food chains.

## Joint PR effort for convention

The first result of the proposed industry wide public relations program is the decision to cooperate in the issuance of publicity from the National Confectioners Association Convention in June.

## Silverman VP of Shattuck Co.

I. J. Silverman, president of W. F. Scrafft & Sons, has been elected a vice president of Frank G. Shattuck Company. Mr. Silverman has been a director of the company since 1951. In 1957 he was named chairman of the executive committee of W. F. Schrafft & Sons Corp., and in 1958 he was elected president of the subsidiary.

## F & F Joins NCA

F & F Laboratories has become an active member of the National Confectioners Association raising the number of Chicago companies which are members to thirty-two. F & F is at 3501 West 48th Place, Chicago.

## Booklet on chocolate available

A 32-page booklet titled "The Story of Chocolate" has been prepared by The Chocolate Manufacturers Association for distribution to libraries and students. The full color booklet covers the history and development of chocolate from its discovery to its present status in this country. This is the first time a booklet of such scope has been published in the United States.

# WE'LL LEND YOU THE KEY TO OUR TOP RESEARCH SECRETS!

Let Sunkist citrus research help enhance your products, or solve your processing problems.

"Know how" responsible for over 400 new citrus products—and 118 U.S. patents on processes—is at *your* service.

It may be our files can supply formulas or technical data by return mail. On any problem, simple or knotty, Sunkist technical experts will be glad to work *with* you—in your own plant—or *for* you—in their own citrus research laboratory. Write, and a Sunkist man will call.

Exchange

**Sunkist Growers**

PRODUCTS SALES DEPARTMENT

**EXCHANGE LEMON OIL GIVES YOUR CANDIES MORE FLAVOR PER DROP!**

One ounce of Exchange Brand Lemon Oil—made by the Sunkist Growers from their own juicy California lemons—will impart good, strong and lemony flavor to 20,000 lemon drops!

Whatever you're flavoring, a little lemon oil goes a long way...so it costs no more to use the best.

And which is the best? Exchange Brand Lemon Oil outsells any other lemon oil four to one.

As to specifications: "Exchange Brand Lemon Oil, U.S.P., California Cold-Pressed" means every drop is pure U.S.P. quality... unadulterated, unsophisticated.

Sunkist Growers pack and seal every container—from the 7-pound tin to the 385-pound drum—in their own plant. Always look for the word "Exchange" on the tamper-proof container seal. You can depend on it.

**QUESTIONS, ANYONE?**

For information on *any* Sunkist industrial product, write Sunkist Growers, Products Sales Dept., 720 East Sunkist Street, Ontario, California.

Exchange Brand Lemon and Orange Oils are distributed in the U.S. by Dodge & Olcott, Inc.; Fritzsche Bros., Inc.; Ungerer & Co.

# *The sweet and the sour*

Today's business world offers so many Conventions that apply to your business that it is sometimes difficult to know if any are worth attending. And yet, you still find cases like the candy manufacturer who at the recent AMA Packaging Show picked up an idea that he claimed would save him four girls on one line. No question that the three days he spent at Atlantic City were worth it!

The National Confectioners Association Convention this year will present *down to earth* scientific management program *geared* to the candy manufacturer. We've all heard prominent speakers at various meetings who talked theory and practice but who did not really understand their ramifications in the *candy* business. Name drawing cards without a candy knowledge calling card!

Not so at the N.C.A. in Philadelphia this year . . . the program committee has come up with the best idea we have seen for many a year. Three professors from the Wharton School of Finance and Commerce will speak on various phases of management, taking the mumble jumble out of modern management methods. The most important phase of this program is that each man has had sessions with industry leaders to acquaint themselves with the various idiosyncrasies of the candy business. And when we say industry *leaders* that's just what we mean. One speaker met with Tom Sharp, president of Whitman's and George Buettner, president of D. L. Clark. Another speaker met with Sam Hinkle, president of Hershey, and Ira Minter, president of Minter's. The third speaker met with Richard Dietrich, president of Luden's and Charles Smylie, executive vice president of National Licorice. Through these discussions the speakers have gathered information that will make their talks of real use to their candy audience.

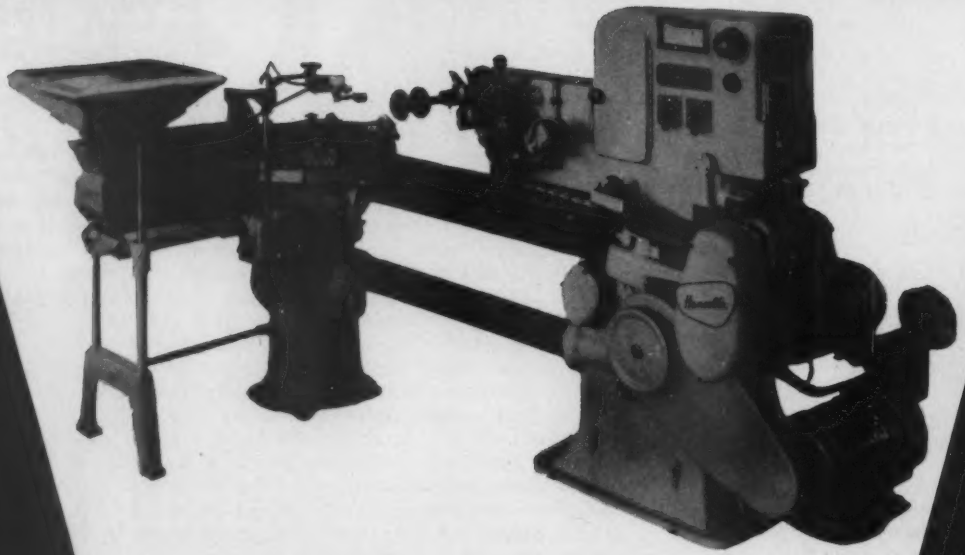
Every day decisions are made on sales, personnel and finance, many by guesswork when they need not be! This is the startling fact which will be presented at the N.C.A. Convention, AND YOU don't have to have 1500 employees to take advantage of the information!

Too often manufacturers will stay away from the talks at the Convention thinking that no one knows their business as well as they do. This is short sighted in 1960 when other industries are aware of the need for sharing information and make use of outside points of view which can produce the solution to problems which they are often too close to to solve themselves.

Other highlights of this Convention are a session on chocolate which should be informative and interesting and answer many important questions on one of our most important raw materials, the AACT sessions where industry men such as Lawrence Rowe of Reese, George Thompson of Vernell-Thompson and Otto Windt of Brach take part, and a top notch sales and merchandising panel composed of Ellis Meyers, president of Read Drug and Chemical, Bernard Jamison, vice president, Sibley, Lindsay and Curr, Carl Hagestrand, merchandise manager of The Kroger Company and Eugene Davis of G. C. Murphy Company.

Last but not least is the Exhibition. This year the largest array of machinery and raw materials ever shown will be in the exhibit hall. More booths have been sold than in many a year. Do not overlook these exhibits—there is information in each booth which pertains to your business. Take advantage of the technical help and new ideas which are available. A simple question in each booth—"What's new," "What do you have for me"—may bring surprising results! A.A.

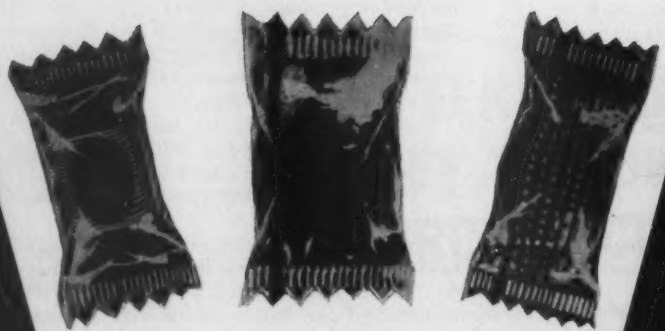
# JET-WRAP YOUR CANDY



## for profits

HIGH SPEED

HIGH FILMSAVINGS



COMPLETELY HEAT-SEALED

EASY-OPENING TEAR-TAPE

Hansella

JET-WRAP

HIGH-SPEED CANDY WRAPPING MACHINE MODEL 25|30

# the Manufacturing Confectioner

**with International Confectioner**

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May, 1960 Volume XL—Number 5
Edited and Published in Chicago
*The Candy Manufacturing Center of the World*

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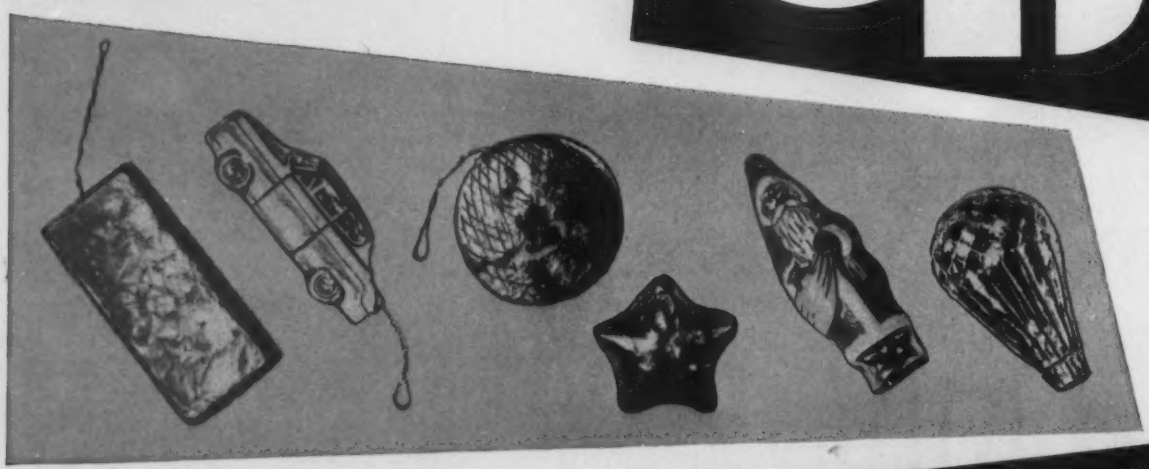

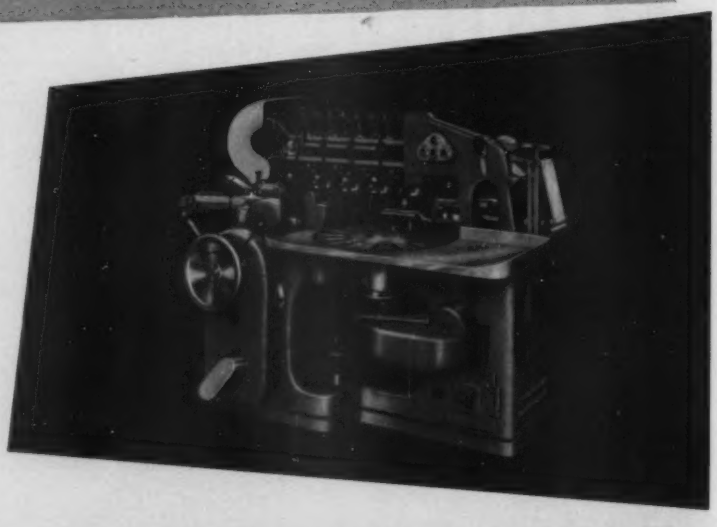

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**May, 1960**

Volume XL—Number 5

# A new device for determining chocolate temper

By James Gardner
J. W. Greer & Company

For many years those handling chocolate have badly needed a means for determining whether or not the chocolate they were using for moulding, depositing, or enrobing was properly tempered. To know the temper just at the beginning of a production run is not enough. Frequent checks must be made endeavoring to maintain the ideal state of temper, or consistently high product quality and maximum production efficiency cannot be obtained. Ideally, of course, a continuous measurement of temper is the solution, but it seems far from realization.

Present methods for the determination of temper are generally based on the fact that the cooling rate of a particular chocolate will vary because of the release of the heat of crystallization. The condition of temper is found either directly by comparison with previous data or indirectly by determining the initial rate of cooling. For many reasons these testing procedures have been proven impractical for anything but laboratory work.

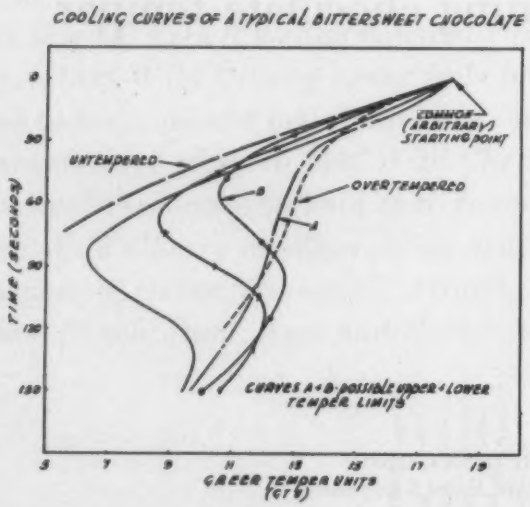
A unit of equipment has been developed that mechanizes this "cooling curve" type of determination to the point that it becomes practical for factory use and production control purposes. The unit, called a Greer Temper-meter, consists of an ice water bath in a standard thermos bottle, a sample tube, a thermistor (temperature sensitive resistor),

a transistorized amplifier, mercury batteries, and an inkless recorder.

A test is performed in the following manner: A sample tube is filled with chocolate (about 10 grams), the excess scraped off, and placed in its holder in the thermos. The thermistor probe is placed in position, the proper recorder scale selected, and recorder started. The degree of temper is determined by the shape of the cooling curve and, in particular, by the GTU (Greer Temper Unit) value at which the cooling curve changes slope. This procedure takes a total of about three minutes.

All coatings have basically the same cooling curve. Differences arise, however, in that bittersweet coatings release more heat of crystallization and at higher GTU values than do milk coatings. Results from combinations of these coatings will fall between the bittersweet and milk coating extremes. As a matter of interest, well tempered bittersweet coatings usually change slope between 14 and 15 GTU's and a similarly tempered milk coating will change slope at approximately 7 GTU's. Figure I is an example of a family of curves for a particular

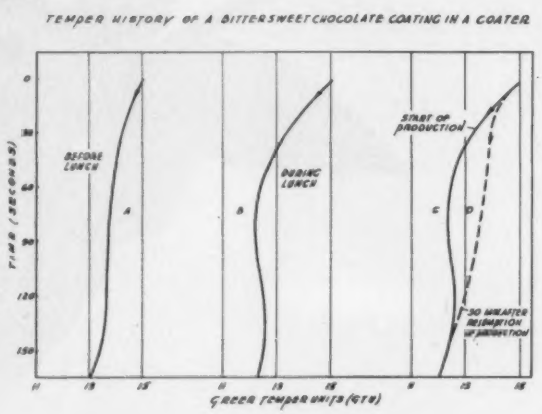
Fig. I


COOLING CURVES OF A TYPICAL BITTERSWEET CHOCOLATE
COMMON (ARBITRARY) STARTING POINT
UNTEMPERED
OVERTEMPERED
CURVES A + B-POSSIBLE UPPER + LOWER TEMPER LIMITS
TIME (SECONDS)
GREER TEMPER UNITS (GTU)

coating, ranging from an untempered to an overtempered condition.

To realize the full potential of cooling tunnels, particularly the new zone temperature controlled units it becomes necessary to control the temper in a coater within narrow limits. These limits may be found by using the Temper-meter along with accelerated shelf-life tests of coated samples. With the coating in an acceptable condition of temper, the Temper-meter probe (with 100 feet of light cable) is placed in the coating on a center and run through the tunnel, producing a cooling curve based on that tunnel's characteristics. By accurately timing the tunnel belt speed, it is possible to determine in which zone the sub-surface chocolate starts to release its heat of crystallization as described above. The temperature in the following tunnel zone may be drastically reduced (to 38-40°F) with no fear of poor product. This lowering of the temperature will result in faster cooling thus making it possible to increase the production rate.

Fig. II


TEMPER HISTORY OF A BITTERSWEET CHOCOLATE COATING IN A COATER
BEFORE LUNCH
DURING LUNCH
START OF PRODUCTION
30 MINUTES AFTER RESUMPTION OF PRODUCTION
TIME (SECONDS)
GREER TEMPER UNITS (GTU)

As a further matter of interest, Figure II shows the temper history of a coater from the time just before the lunch break to thirty minutes after the resumption of production. When production was resumed, the temper (curve C) was definitely not as good as it had been, and had about reached the point where poor gloss and shelf-life would result.

This system is an ingeniously mechanized adaptation of the basic research tool of the research laboratory. Because of the need to reduce all variables to one, this being time of cooling, the method becomes a purely empirical device, useful only in comparison with previous tests run under identical comparisons. The GTU are entirely arbitrary figures to simplify comparisons, but without any fixed absolute reference.

The real significance of the development of this equipment is to bring the ideal of automatic temper control one step closer to reality. We think that this equipment does just that, providing the most useful information on the condition of chocolate temper yet.

---

Information has been received from Norman Kempf whose paper on "Research on fats for confectioners' coatings" appeared in the March 1960 issue of *The Manufacturing Confectioner* that information will be available soon which will clarify the statements made in the fifth paragraph on the second page of this article. Mr. Kempf has stated that further progress has been made in research on this problem and Dr. Feuge has made new discoveries that minimize the importance of the statements made in the paragraph mentioned.—*The Editor.*

# *Impact of cocoa bean quality on chocolate products*

By Donald G. Mitchell
Walter Baker Chocolate

One of the major ingredients used by most confectionery manufacturers today is chocolate in one of its various forms. The greatest use is as a coating of various types of centers whereby complimenting effects can be obtained. Lesser quantities of chocolate and its counterpart, cocoa, are used as a flavoring of confectionery centers, fudge and other products.

Of particular concern is the quality of the chocolate product. It is of concern to the confectioner because as its quality fluctuates so too will the public acceptance of his manufactures. Although the chocolate manufacturer can do much to offset varying qualities of cocoa beans through skillful blending and control of his processing, his end product still is influenced strongly by his selection of the basic raw material—cocoa beans.

It is desired to point out to you, the major users of chocolate products, what are the important qualities to be observed both by the chocolate manufacturer as well as the consumer. Perhaps the best way to develop an appreciation of these characteristics is to realize why they occur. The next important consideration is what can be done to develop the good features and control the poor ones. Accepting the fact that the latter presently cannot be eliminated, it might be desirable to know what can be done either to avoid them or to minimize such color and flavor defects in order to produce a wholly acceptable product.

Probably one of the greatest factors affecting cocoa bean quality is one of supply. Most of you no doubt are aware that cocoa beans are the product of a native agriculture in the countries of Africa, South and Central America and the Caribbean Islands. Here the level of intelligence is not high, the principles of product control are not understood and in today's market the matter of price carries considerable weight as far as incentive is concerned.

In the native countries of cocoa cultivation there are very few instances where the cacao tree is cultivated scientifically. Many, many cocoa farmers cultivate only a small acreage and with few exceptions, an acre of cocoa trees produces only 200-300 lbs. of cocoa beans annually. Imagine, if you will, the numbers of farmers producing cocoa beans for the market when it is expected that this year's crop will total over 950,000 tons.

Cocoa beans to have good flavor and color qualities for the particular type should be controlled carefully at many stages of their development. But, many factors come to play while the bean is still in the tropics. The results of tropical processing remain with the bean when it comes to the chocolate processor to convert to finished chocolate for the confectioner.

Let us consider briefly some of the situations which occur and the defects which result. First of all good cocoa results when ripe pods are harvested, immediately opened, the fresh beans carefully fermented for the proper time, at the proper temperature, and with good mixing, and the resulting product rapidly dried to 5-6% moisture, so that there is no danger of mold development. The ideal control gives a product with a good red or yellow brown color, the hue depending on botanical variety. In addition, there should be developed the flavor precursors with the proper balance to produce the desired flavor when the chocolate proc-

essor performs his operations. Cocoa beans in the raw state do not have a true chocolate character. The tropical fermentation develops only the precursors which will produce chocolate flavor when subjected to the heat of roasting.

By contrast, the harvesting of unripe pods results in a low sugar content pulp around the beans and in turn low fermentation temperatures. Overripe pods contain sprouted beans which develop off-flavors on fermentation. These situations occur when the farmer does not pick pods at the proper time.

The native has no appreciation of bacteriological processes, yet he conducts one in the fermentation of cocoa beans which has a major effect on the chocolate flavor we are able to produce. The temperature range of the fermentation is quite critical in order to promote the enzymatic changes for the development of flavor precursors. Too low a temperature gives so-called hammy type flavors from incomplete activation of enzymes, while too high a temperature results in the destruction of the enzymes before they can complete their job. The hammy type flavor may be found principally in Bahia, Cameroon and Samoan cocoa.

Time is an equally important factor in fermentation. One hears a color described as "chocolate brown" but those who have observed the ingredients and the finished product to a finer degree realize that the color can range from a distinct purple to a reddish brown and to various shades of gray. All of these variations depend on the care given the fermentation particularly time.

Flavor results from the control of fermentation time parallel color. Good color results are in general indications of the proper type of flavor. The purple and the gray gradations of brown are astringent, sometimes bitter and lack the proper aromatic characteristics of the variety. If the precursors of these flavor characteristics are not developed in the cocoa in the tropics, the chocolate manufacturer certainly is not going to be able to develop them in his processing.

Most of the defects cited previously are the results of sub-standard conditions of operation. Although color may not be affected, flavor can be impaired by excessive fermentation. In the normal process the natural sugar contained in the pulp surrounding the beans of a ripe pod is fermented by the natural yeasts. The process develops in much the same way as does the fermentation of apple juice or cider. An alcoholic fermentation develops and ultimately carries through to the development of acetic acid. However, if the process is not halted at the proper point it is possible to develop into a butyric fermentation. This will result in beans with a pronounced cheese-like flavor. This is found at times in Venezuelan varieties and sometimes in the Tabasco beans from Mexico.

There are other off-flavors which are noted from time to time in cocoa from various areas. Generally, it is a lack of characteristic flavor which cannot be ascribed to a particular cause. However, it is another handicap in attempting to produce a satisfactory finished product. It may come from inadequate control of fermentation or even from the particular botanical variety or clonal variety which was harvested.

In addition to developing color and flavor effects from a bacteriological process, the cocoa beans are left with varying bacterial infestations. The surface of the unshelled beans will be found to have relatively high counts of bacteria, yeasts and molds. To add to the problem is the fact that many of these organisms are thermophillic or are resistant to elevated temperatures. This results from the fact that many organisms develop a capacity for adapting themselves to their environment. If they exist in a fermenting mass of organic material where elevated temperatures are developed they will adapt to them. Fortunately, however, none of these are pathogenic types.

When some of these organisms are subjected to conditions not conducive to their growth they encapsulate themselves as spores until their environment improves. Thus they are not destroyed in the later drying of the beans. They are not destroyed in the chocolate manufacturer's roasting process even with the high temperatures that are used.

The residual organisms are a problem in two principal areas. Where the chocolate product is used as a dairy product ingredient as in ice cream or milk it may contribute counts which will cause the final product to exceed existing public health standards. A second problem area is where cocoa powder or chocolate liquor is used as an ingredient in a vegetable fat coating. Such coatings presently use lauric-type fats. When the proper combination of mold, lauric-type fat and moisture come together there is the danger of the development of undesirable soapy-type flavors. This occurs because the molds vegetate in the presence of moisture and produce enzymes which will split the lauric esters in the fat. The resulting compounds, while not actually soaps, do have a flavor resembling soap.

On conclusion of fermentation the beans must be dried prior to storage or shipment. Again the same primitive type of treatment prevails. Only in a few instances are the beans dried by artificial heat. In most areas they are spread in the sun and manually turned. As you can see the native is extremely dependent on good weather to accomplish speedy drying. Poor drying conditions result in the development of undesirable flavors as the fermentation may continue as long as the moisture level is high enough. Incomplete drying may allow for mold growth either immediately or during later storage. Even when artificial drying is available, lack of care and control often leads to undesirable flavors such as when smoke from the fire contaminates the beans. So called smoky flavors are found from time to time and little can be done by the chocolate manufacturer to correct them.

The preceding remarks indicate how cocoa bean quality is affected at the various stages in its processing in the tropics. It is easy to see how situations occur which will lead to sub-standard products. The native grower is dependent on local weather

conditions, consequently many undesirable effects can occur if the season is excessively rainy and wet. The pods are not harvested as frequently as they should be to obtain them at maturity. With no sun fermentations do not develop as readily and when it is time to dry the beans there is no heat for drying. It is apparent that non-uniformity exists in all of the processing conditions applied in the tropics.

During the past fifteen years frequently there has been a shortage of cocoa beans. Speculative buying as well as actual demand cause fluctuating and high prices. It is difficult to determine how much effect these situations have on cocoa bean quality. If beans are withheld from shipment in hope of higher prices there are the dangers of infestation and of off-flavor development from dampness or from storage near other odorous materials such as rubber.

Realizing the potential pitfalls from the tropical processing, it may be small wonder that we receive as good a product as is generally the case. Of course, considerable blending of various lot of bean takes place. On many occasions I have observed the dumping of bags of cocoa beans. It is amazing to see the variation in color of the outside of the beans indicating the differences of treatment. These differences occur from bag to bag and also with a single bag.

If the variations of the crops are as bad at times as has been indicated, the natural question is what is done to protect finished chocolate quality. Some countries attempt a grading of cocoa beans prior to export, retaining those which are below a certain standard as indicated by cross sectional color of the bean. Even this degree of control allows some pretty poor cocoa to be exported. The chocolate manufacturer has got to be careful in the cocoa beans which he purchases as well as the manner in which he uses them. Most chocolate products are made from blends of cocoa beans. Each type going into a blend is selected for its particular contribution of flavor and color. Consideration must be given in establishing such blends that the flavor defects which may appear in individual types will not be factors in the finished chocolate product.

Another solution to this problem for the chocolate manufacturer is processing. The undesirable flavors are not often volatile so that simple heat and aeration seldom are adequate. Although these factors help, in addition efficient mixing under controlled temperature conditions such as in conching is needed to allow for the enteraction of ingredients as well as volatilization. Actually the mechanics of flavor improvement by processing are not well understood. The quantities of objectionable flavor materials are extremely small and until recently there has been no way of measurement, let alone identification. In the September 1959 issue of the International Chocolate Review W. Mohr of the Institute for Food Technology and Packaging in Munich, Germany reported on "The Investigation of Cocoa Flavor by Gas Chromatography; With Special Reference to Chocolate Conching". From this work it would appear that a quantitative method has been found and with additional work it is expected that the various flavor components will be identified. This particular paper showed quantitative differences in certain unidentified compounds before and after conching sweet chocolate.

Five principal types of flavor defects occur which are of major concern: bitterness, astringency, hamminess, lack of characteristic flavor and musty or moldy flavors. The first two can be controlled by proper processing. Hammy flavors are almost impossible to mask or destroy either in sweet chocolate, chocolate liquor or cocoa powder. There is the problem of the flavor per se; and there is also the danger of the hammy flavor increasing in strength as the product ages. This is considering the finished product's flavor when it is four to six months old.

"Lack of Characteristic Flavor" is a problem with no immediate solution. If a lot of flavor bean type cocoa such as Trinidad or Venezuelan does not have its usual identifying flavor no presently known processing is going to put it there. Undoubtedly it was lost through improper fermentation whereby the flavor precursors never were produced.

Color, while of lesser importance, is of concern when the question of uniformity is considered. Each bean variety when properly prepared has a normal color depth and hue. Poor tropical fermentations produce colors that are described as purple and slatey for which there is little cure in chocolate products.

The quick answer to all of the problems which have been mentioned is to establish specifications for cocoa beans as a raw material. This would be fine as far as assuring a uniform incoming ingredient, but it is feared there would be many instances when the manufacturer would find himself short of cocoa beans if he lived by the specification. With the limited supplies available and the variations from crop to crop there are times when the desired types of cocoa just would not be available.

How many industries purchase a basic ingredient of as high a monetary value in such quantities for which so little is specified? Last year (1959) the United States imported 205,000 tons of cocoa beans value at approximately $156,000,000. When cocoa beans are purchased for delivery the only things that can be assured are that if the shipment passes the usual clearances at port of entry it should contain less than five per cent of moldy beans and the combination of wormy and moldy beans is less than ten per cent. There are no requirements for color or flavor by any empiracal tests and yet these are the two primary features which the chocolate manufacturer has to sell in his product.

Moisture contents of cocoa beans vary excessively from some areas. Normally they should be between six and seven per cent and yet much higher results are found. Sanchez beans from the Domini-

can Republic seldom are below eight per cent moisture and at times are over ten per cent. Less frequently Brazilian and Trinidad cocoa will show high moisture contents. As long as the high moisture contents do not result in moldy and musty flavors the principal loss is an economic one.

Little work has been reported on the measurement of other criteria which have a bearing on cocoa bean quality. Such variables as titratable acidity, water soluble tannins, total volatiles as well as others might be indexed but they represent only portions of the overall flavor. During the past several years we have made measurements of the pH of liquors on each shipment of beans and have found it to be a fair index of the degree of fermentation. Possibly as new and improved techniques of gas chromatography are developed it will be possible to evaluate cocoa bean shipments for flavor quality and thereby relate them to finished goods qualities.

From past experience it has been found that the safest way to insure the chocolate quality of finished products is a careful evaluation of the basic raw material. Each shipment of cocoa beans is sampled so that the most statistical significance is achieved within the limits of practical operation. The sample is mixed thoroughly and aliquots taken for evaluation. Of primary interest is flavor; therefore, a sample is roasted by a standard procedure and processed to liquor.

This liquor is evaluated for flavor by skilled tasters and its best use determined on the basis of similarity to standard types. The best evaluation of color can be accomplished in this form too. Many people attempt to assess color based on the cross sectional appearance of the cut raw bean. There are so many gradations that it is very difficult to make an accurate evaluation. Actually a sample of beans is cut and the cross section observed. The primary consideration, however, is to assure compliance with entry requirements on worm and mold count. Similar counts are made on purple, slate and brown beans but an accurate correlation with flavor has not been established.

It might be of interest to know of the economic evaluation that is made on another aliquot. A moisture analysis and shell content are determined. From these values can be calculated the theoretical shrinkage which may be expressed in various ways. One might be surprised at how uniform such values run for a variety within a crop year. With the many variables involved it is perhaps surprising that the range is not greater.

All of the comments to this point are on the defects of cocoa beans, their causes and their effects on chocolate products. This does not mean that such defects occur in every shipment but they happen too often and are one of the big problems of the chocolate manufacturer.

The question one naturally asks—what is being done to help the situation? As the early discussion of the subject indicated, the root of the trouble lies in the tropical processing. Consequently, education of the native producer is being attempted. Dr. Ernest P. Imle, Director of Research of the American Cocoa Research Institute at this conference last year described some of the activities of his organization in the tropics. The college at Turrialba, Costa Rica, in addition to teaching agronomy is teaching cocoa growers in this hemisphere better fermentation methods. Similar agriculture extension work is being carried on in the African areas. As efforts are made to study fermentation methods, as well as to locate improved varieties of beans the American chocolate manufacturer is assisting by evaluation of product. Such efforts are handled by the Technical Committee of the American Chocolate Manufacturers Association, The evaluation is of chocolate liquor produced from the bean samples just as I described earlier for cocoa bean shipments.

In the interest of better control of the cocoa bean quality coming into the country the Food and Drug Administration during the past year embarked on a major program for the evaluation of shipments from all sources entering the United States. The primary concern was moldy beans, wormy beans and live insects. During this study approximately 7500 samples were to be inspected from those taken at each port with proportional representation of each producing country. At the present the data of this program is still being studied. From it may come new standards for the criteria previously mentioned.

The problem of assessing cocoa bean quality is of equal concern to the European chocolate producers. Although they have made considerable study of the subject as well they have no satisfying solution. The subject is on the agenda of the International Cocoa and Chocolate Association (O. I.C.C.) meeting in Rome this month and it will be of interest to learn of their deliberations.

The best control of the overall problem of cocoa bean quality still rests with the individual chocolate manufacturer. The chocolate product consumer is dependent on him for a discriminating selection of his raw material. He should evaluate and select the proper lots of cocoa beans for the maximum color and flavor quality and so process the overall product to achieve the greatest benefit. It is this service for which the consumer is paying. The manufacturer must realize that fundamentally the things he is really selling are flavor and color. The equivalent food value can be purchased as or more cheaply in many other forms.

The foregoing remarks should not be construed as raising a chronic complaint. On the contrary, it is to acquaint you with a recognizable problem which is of considerable concern to both the European and the American chocolate manufacturer. Expression of concern for it is not to find fault with the cocoa bean grower but is honest evidence of a chocolate manufacturer's concern for quality.

In the meantime it is the responsibility of the chocolate processor to maintain uniform high standards of quality. At the same time he should encourage and aid in the improvement of tropical techniques for better and more uniform lots of cocoa beans in the future.

# *The properties of various milk products and their use in different types of candy*

By Byron H. Webb
National Dairy Products Corp.

Milk and its products are basic ingredients in many confections. The problems of supply and use of dairy products are therefore of interest to both milk processor and candy manufacturer. Let us look together, then, at some of the problems concerned with the use of milk ingredients by the candy industry. First, I should like to examine the basic properties of the dairy products we use and their function in candy.

Milk is composed of only 4 basic constituents that need be considered in candy processing. These are milk fat, milk protein, milk sugar and milk minerals or ash. To these, in processing, the dairyman may add sugar to prepare special sweetened products. Milk is also rich in vitamins and of course its water content affects its processing and the products we make from it.

To help understand the behavior of these milk components in your candy product, let us review their basic characteristics.

Milk fat is relatively soft with a melting point of about 90°F. Although differing chemically from other fats used in candy, it has the usual physical characteristics we associate with food fats. The most distinguishing characteristic of milk fat in candy is the fine milk flavor it contributes. Chemically modified fats of satisfactory physical properties can be purchased for candy requirements but science has never been able to artificially create the flavor milk fat can impart to a confection. This flavor can be intensified for certain purposes by enzyme action. Fat-splitting lipase which occurs naturally in milk has been used to hydrolyze milk fat in products especially designed for chocolate manufacture. The rate of enzyme action, in this case rancidity development, is largely a function of temperature. Raw milk contains sufficient lipase to rapidly hydrolyze the fat but the enzyme is largely destroyed by ordinary pasteurization. Homogenization increases free fat surfaces and will produce intolerable rancidity in raw milk in a few seconds. Through controlled conditions the required flavor intensity can be produced.

Milk fat can cause serious flavor deterioration in candy. Excessive hydrolysis produces objectionable rancidity; lipase containing ingredients should receive the equivalent of 190°F. for 30 minutes to completely destroy the enzyme. A high degree of acidity in a milk product can induce rancidity. Another flavor defect associated with milk fat is oxidation producing tallowiness. Oxidized flavor is best avoided by using high quality dairy products that have not been excessively exposed to oxygen or metal contamination. The flavor may be slow to develop but it is sometimes found in over-age or poor quality dried whole milk.

Milk protein is essential for the development of proper body, flavor and color in cooked candies such as caramel and fudge. The major protein of milk is casein which is capable of forming a firm, resilient chewy type of body, neither sticky nor tough. Casein appears to form with sugars a plasticized mass which is a major body builder and this is effective in proportion to its concentration. Skim milk contains about 3.6% protein of which 2.6% is casein and 1% whey protein including some non-protein nitrogenous matter.

Whey protein remains after casein is removed in cheese making. It forms with heat a soft flocculent coagulum less capable of contributing structural firmness to candy than casein. But the whey proteins surpass casein in foaming characteristics. At high concentrations and viscosities such as may be found in sweetened condensed whey, a moderate-

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ly stiff foam of good stability can be formed. However a whipped whey or milk albumin foam cannot be set by heat, a property unique with egg white.

Milk sugar or lactose, present in milk to the extent of about 5%, has a sweetness of about 18 when sugar equals 100. Similarly the solubility of lactose in water at room temperature is about 20%. Lactose then is the least sweet and the least soluble of the sugars used in the candy industry. But it may not be the first sugar to crystallize in your product because it forms quite stable highly saturated solutions. These solutions of "lactose glass" may be stable enough so that there is 2 or 3 weeks shelf life before graining. For more body stability we should resolve the lactose problem. If the lactose content of a candy is below about 3% its crystalline fate can be ignored. But if a candy contains 5-10% or more lactose, consideration should be given to getting it into a permanently stable crystalline state. To do this we usually resort to forced crystallization, a procedure to induce the formation of small uniform sized crystals which will insure shelf stability. The most efficient crystallization method for sweetened condensed milk is to cool to 86°F., seed and stir at this temperature about 3 hours then cool to 68°F. or to a low storage temperature. A candy mass, however, is hotter, more concentrated and more viscous so it cannot be handled as easily as sweetened condensed milk. The rule to follow is to cool as low as possible but not at the sacrifice of adequate handling fluidity, then if fondant or other additives are to be used make these additions, stir finally and pour to set. A few ounces of lactose seed should be used to start crystallization just as fondant is added to aid in graining fudge. Indeed best results can be obtained through use of a small quantity of a lactose fondant. This is made by crystallizing pure lactose in an invert sugar sirup.

Milk sugar can be hydrolyzed by acid or the enzyme lactase to produce an invert lactose consisting of equal parts of glucose and galactose. The sweetness of this mixture is still less than half the sweetness of sucrose. At room temperature the solubility of glucose in water is 50% and of galactose 32% which means that hydrolyzed lactose is about twice as soluble as the original sugar. There is no significant hydrolysis of lactose in the cooking of candy nor has hydrolysis of lactose in dairy products to be used in candy ever been put to practical use.

The chemistry of lactose is more complicated than most sugars but as we continue to study it our understanding increases. I would like to briefly discuss a characteristic of lactose of importance to the candy and food industries, the significance of which I think we have not hitherto fully recognized. When lactose crystallizes the growing crystals adsorb on their surfaces colors, pigments and odors. Riboflavin can be adsorbed in heavy concentration if large amounts of it are available to the crystals as they form. This characteristic must

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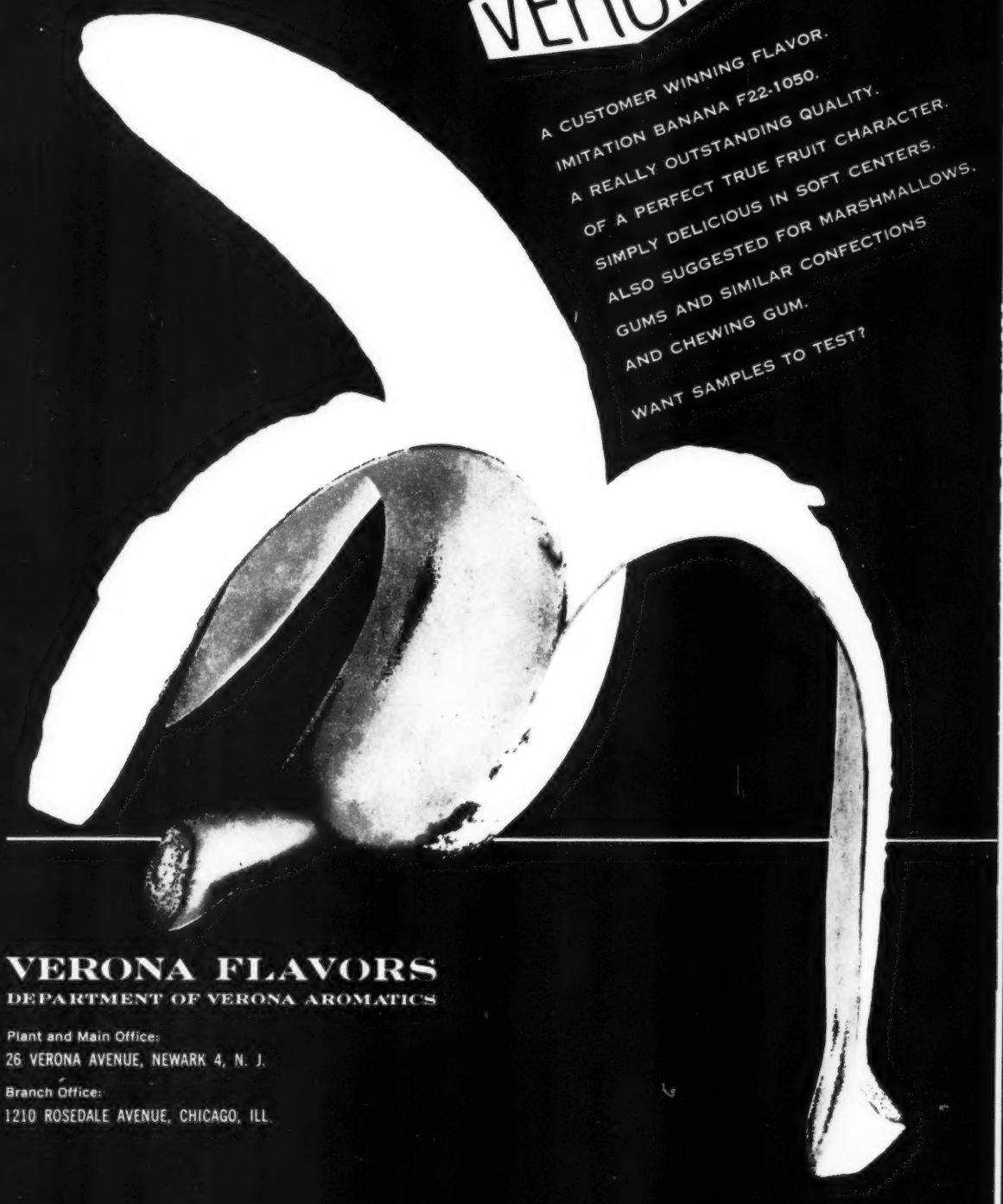


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also be present in the dairy and candy products in which lactose crystallizes. Sweetened condensed whole milk, skim milk and whey contain high concentrations of minutely crystallized lactose. Some lactose in certain forms of milk powder is crystallized during the drying process to make a powder resistant to water absorption. When lactose is present in fudge in considerable quantities it may be crystallized in the candy. The theory is advanced that when the lactose crystallizes in these products it adsorbs the unstable volatile milk flavors holding them in the crystalline structure until they are released by melting in manufacture of other foods or in the mouth if the product is eaten directly. This explains why the sweetened condensed dairy products containing crystalline lactose so effectively hold and transfer milk flavor.

Let us now consider the dairy products available to the candy industry. Their composition and some of their properties are shown in the accompanying table.

Fresh fluid products including milk, cream, skim milk, buttermilk and whey are of course the most flavorful dairy products for the confectioner. But they are perishable, not always readily available, and heavy with water which the candy manufacturer may find inconvenient to remove. The dairy industry has therefore produced an array of milk concentrates for confectionery use. We will briefly examine some of these.

Butter, an 80% milk fat concentrate, leads all dairy products in flavor potency. But butter itself varies in flavor intensity. Butter made from sweet cream possesses a mild, sweet, delicate flavor which can be submerged by the use of strong candy flavoring ingredients. Butter made from ripened or cultured cream contains a high level of diacetyl which in turn imparts the desired rich milk fat flavor to candy. To obtain maximum flavor from butter or any dairy product excessive and prolonged boiling in the candy mass should be avoided. Last minute incorporation in the mixture is desirable.

The plain condensed milks not having added sugar are perishable and must be refrigerated. Like the sweetened products these too are highly regarded for their body and flavor characteristics. Evaporated milk is sterilized in cans of gallon-size or smaller to preserve it during indefinite storage periods. The mildly heated flavor of evaporated milk gives it a start toward development of the attractive caramel flavor produced by the heating of milk and sugar.

Milk salts have an important bearing on the physical dispersion of the milk proteins but it has not been shown that this carries through to the candy mixture. Milk salts contribute in an important way to the characteristic flavor of milk and they no doubt also affect candy flavor. The candy manufacturer does not buy milk salts as such but takes the measured quota the cow puts into her milk. It should be pointed out that whey contains the largest relative proportions of lactose and salts of any dairy product.

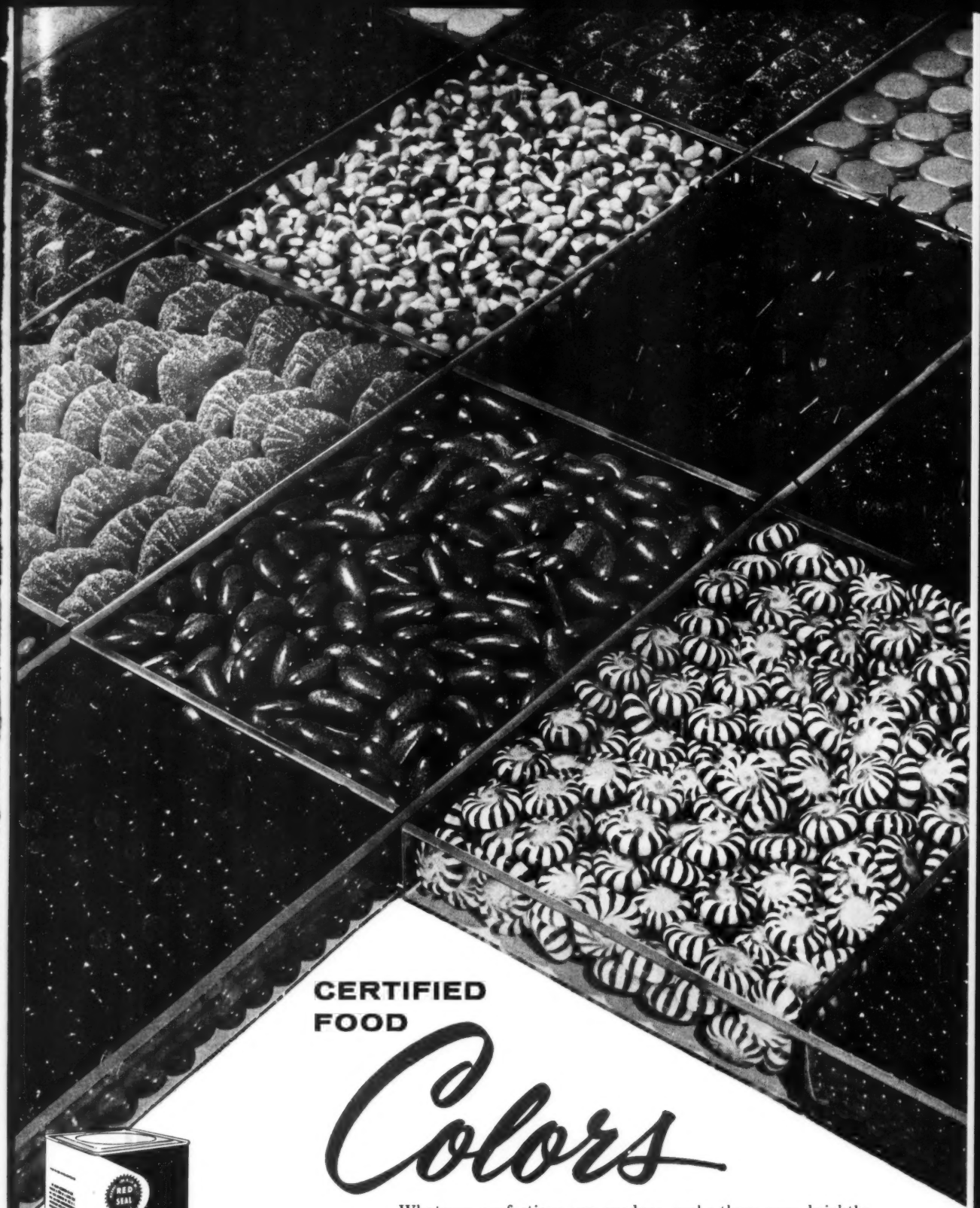
Sweetened condensed milks are preserved by their sucrose content so that use of sterilizing heat is avoided. They are recognized for their ability to capture and hold milk flavor and transfer it to confections. The products are made by adding sucrose to whole or skim milk, forewarming, condensing and cooling to properly crystallize the lactose. Sweetened condensed milk should be held cool, preferably below 60°F., during storage.

Sweetened condensed whey was developd to fill the need for a simple and inexpensive method for preserving whey for food manufacture. Commercial production of the product has been limited but both sweetened condensed whey and sweetened condensed milk still remain the preferred sources of whey and milk solids where smooth, easily blended, free flowing ingredients of high milk flavor transfer characteristics are desired. Sweetened condensed whey is made by adding sugar to sweet cheese whey, pasteurizing, condensing, cooling and crystallizing the lactose. The whipping properties of fat-free sweetened condensed whey are of interest. At room temperature it may be whipped to 200% overrun in 3 to 4 minutes. The whip will stand without drainage for many hours but it will not set with heat. It may be used to introduce air into a cooked, partially cooled candy mixture or sirup base. The stiffening mixture entraps and holds the air. Sweetened condensed whey foam is not stable in fluid fat containing mixtures.

The dry products listed in the table have the advantage over fluid products of reduced bulk, ease of handling, no excess water to boil off in cooking candy batches and long storage stability at room temperature. Dried whole milk and dried buttermilk when bulk-packed for manufacturing use have the shortest storage life of the dry items listed, only a few weeks at room temperature. For long storage stability dried whole milk must be gas-packed. Dried sweet cream buttermilk is high in protein and it contains the phospholipid residues that were separated from the fat globules in the churning of cream. This surface-active emulsifying material can produce a creamy richness in candy.

Dried whey is the most practical form of whey solids to use in food manufacture. The edible product is usually spray dried in such a manner as to have a minimum of hygroscopic properties. It can give a milk flavor and some of the physical characteristics of non-fat milk to candy at low cost. Since whey results from cheese making, it retains some of the special flavor characteristics associated with the cheese ripening process. Whey has a tendency to accentuate other flavors present, whereas non-fat milk solids may have somewhat of a masking effect on other desirable flavors. Whey, because of its high lactose content, usually imparts a golden color upon heating which would not be expected to the same extent from non-fat milk solids.

Malted milk is well known for its malt flavor producing qualities. Its high dextrin content con-



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tributes to body just as does the dextrin in corn syrup.

Milk crumb is an intermediate product in the manufacture of milk chocolate. It is not a standardized dairy product of well known composition but is usually made by the chocolate manufacturer to his own specification. It furnishes him with a dry, readily storable, preserved whole milk product that will transmit a characteristic milk flavor to chocolate. Milk crumb is a dry friable mass of closely associated milk solids, sucrose and chocolate liquor. It is made by mixing a precondensed milk-sucrose mass with chocolate liquor in equipment such as a dough mixer. The mass containing about 14% moisture is spread on trays or a belt and dried under vacuum. The chocolate acts as a mild anti-oxidant and slight lipase action may be used to develop desired flavor.

Butter oil is made either from butter or directly from cream by centrifugal separation. It is an anhydrous concentrate of milk fat which has better keeping quality than butter and which saves on storage space and shipping weight. For use in candy and other foods butter oil should be emulsified with milk or a suitable fluid mixture containing protein or a surfactant. Butter oil is the most potent source of cream or butter flavor available.

Sodium caseinate, the sodium salt of casein is pure milk protein in powder form with a reaction in water of pH 6.6. It requires mechanical agitation to disperse it in water but when mixed with equal or greater parts of sugar it will disperse readily. The viscosity of sodium caseinate increases rapidly with concentration so that at concentrations in excess of about 18% it is too viscous for easy handling. Sodium caseinate is a very effective builder of body in confections and is a useful protein supplement to the other commonly used milk products.

Lactose or milk sugar is prepared from whey in an inexpensive food grade. It is used in the production of caramel color, as a seed material to induce formation of fine crystals in condensed milks and in fudge made to contain high concentrations of milk sugar. Lactose absorbs pigments and odors readily and is useful to fortify milk flavor in candy and especially chocolate. Since most dairy products contain some lactose the confectioner must decide if additional quantities as pure lactose are needed to obtain his particular body and flavor objectives.

To summarize, we have examined the four milk constituents important to the confectioner: milk fat, milk protein, milk sugar and milk salts. Each of these contributes in an important way to the body, flavor or storage stability of candy. There are three broad classes of dairy products available: (1) fresh products, (2) concentrated products and (3) dry products. Within these classes the detailed composition of 22 individual dairy products useful to the candy manufacturer have been given.

COMPOSITION OF SOME MILK PRODUCTS

| | Composition | | | | | |
|---|---|---|---|---|---|---|
| Fresh Products customary storage—40°F. | water % | protein % | fat % | milk sugar % | ash % | sucrose % |
| light cream | 72.5 | 2.9 | 20. | 4. | 0.6 | – |
| heavy cream | 59. | 2.3 | 35. | 3.2 | .5 | – |
| whole milk | 87. | 3.5 | 3.9 | 4.9 | .7 | – |
| non-fat milk (skim) | 90.5 | 3.5 | 0.1 | 5.1 | .8 | – |
| buttermilk (sweet cream) | 91. | 3.4 | 0.4 | 4.5 | .7 | – |
| whey (1) | 93.1 | 0.9 | 0.3 | 4.9 | .6 | – |
| Concentrated Products group 1. customary storage—40°F. | | | | | | |
| butter | 15.5 | 0.6 | 81. | 0.4 | 2.5 | – |
| condensed whole milk | 65. | 9.4 | 10.5 | 13.2 | 1.9 | – |
| condensed skim milk | 70. | 11. | .3 | 16.1 | 2.6 | – |
| group 2. customary storage—60°F. | | | | | | |
| evaporated milk | 73.7 | 7. | 7.9 | 9.9 | 1.5 | – |
| sweetened condensed whole milk | 27. | 8.1 | 8.4 | 10.6 | 1.7 | 44.2 |
| sweetened condensed skim milk | 28. | 11. | .3 | 16.1 | 2.6 | 42. |
| sweetened condensed whey | 24. | 5.3 | .6 | 28.6 | 3.5 | 38. |
| Dry Products customary storage—70°F. | | | | | | |
| whole milk | 2.0 | 26.6 | 26.8 | 38.6 | 6. | – |
| non-fat milk | 3.5 | 35.6 | 1. | 52. | 7.9 | – |
| buttermilk (sweet cream) | 2.0 | 37. | 4.4 | 49. | 7.6 | – |
| whey (1) | 4.0 | 12.5 | 1.4 | 71.0 | 8.3 | – |
| malted milk (2) | 3.3 | 14.6 | 8.5 | 21.5 | 3.6 | – |
| milk crumb (3) | 1. | 9.8 | 10.9 | 13.8 | 1.9 | 52.1 |
| butter oil | 0.1 | – | 99.9 | – | – | – |
| sodium caseinate | 4.0 | 89.5 | 1.5 | 1.0 | 4.0 | – |
| lactose (food grade) | 0.2 | 0.4 | – | 99. | 0.4 | – |

(1) Lactic acid: in whey 0.2%; in dried whey 2.8%
(2) Maltose 1.5%, dextrins 47.0%
(3) Chocolate liquor 10.4%

# *The function and behavior of low conversion corn syrup in hard candies*

By John A. Kooreman
Penick & Ford, Ltd.

At the 9th PMCA Production Conference on April 28, 1955, I was privileged to participate in a symposium on the general subject of high conversion corn syrup—its advantages and limitations in confectionery, in collaboration with Messrs. Brock and Kmo. At that time three principal classifications of corn syrups were described: the commonly known "regular" and "intermediate" types which provided a background for interpretation of comparative values characteristic of the "high conversion" type. Today, we shall follow a similar approach by setting out analytical data of regular corn syrup as background information which shall serve to differentiate the principal subject of this discussion—low conversion corn syrup—in a manner that reflects current and more complete reporting of physical and chemical properties. (Fig. 1)

**Fig. 1.**

| | Acid Hydrolyzed | |
|---|---|---|
| | Low Conversion | Regular Conversion |
| Baume' | 43° | 43° |
| Moisture | 20.4% | 19.7% |
| Total solids | 79.6% | 80.3% |
| Dextrose equivalent | 34% | 43% |
| Monosaccharides (c.b.)* | 12.8% | 19.5% |
| Disaccharides (c.b.)* | 10.9% | 14.2% |
| Trisaccharides (c.b.)* | 9.7% | 11.8% |
| Tetrasaccharides (c.b.)* | 9.0% | 9.9% |
| Pentasaccharides (c.b.)* | 7.7% | 8.4% |
| Hexasaccharides (c.b.)* | 6.4% | 6.5% |
| Heptasaccharides (c.b.)* | 5.5% | 5.7% |
| Higher saccharides (c.b.)* | 38.0% | 24.0% |
| Ash (sulphated) | 0.30% | 0.30% |
| pH | 5.0 | 5.0 |
| Viscosity @ 100° F., poises | 230 | 125 |

*Carbohydrate basis

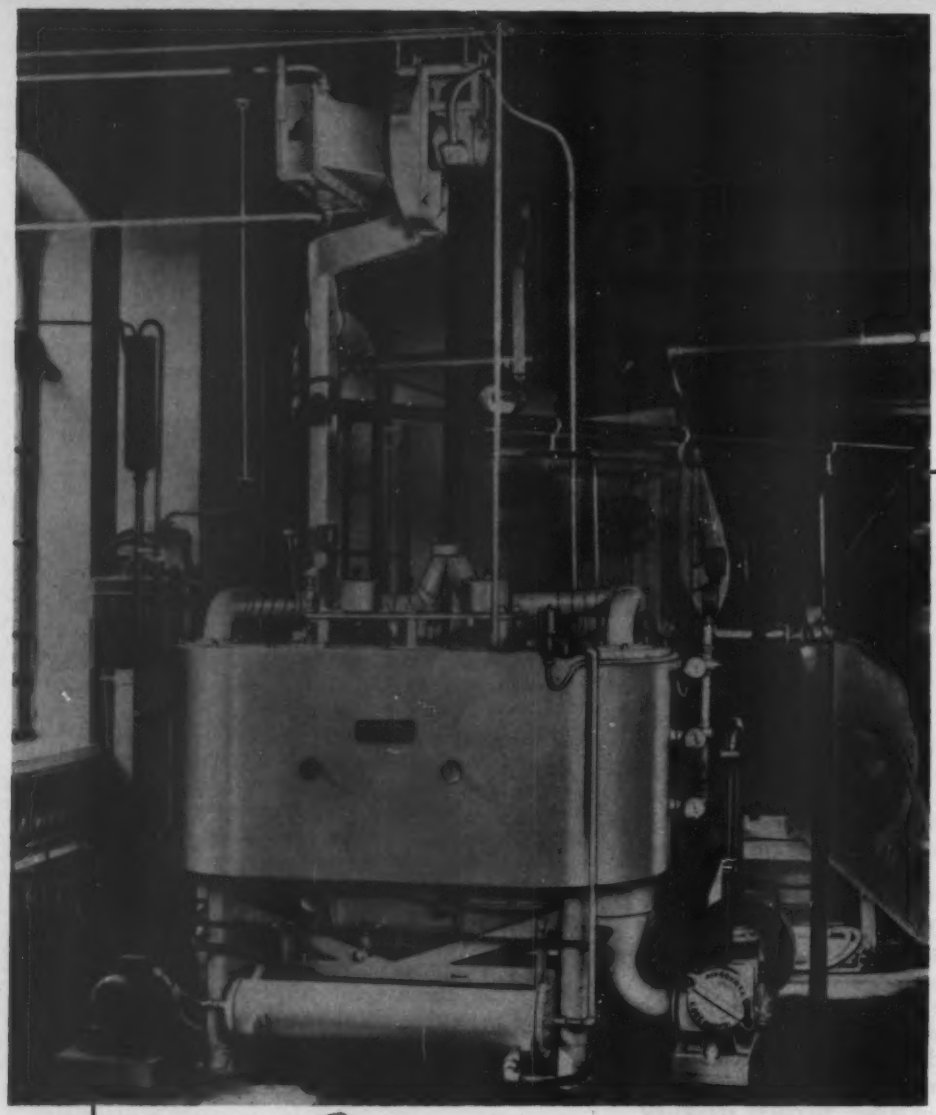
The reason that only two types are described is because this discussion is limited to consideration of hard candies, where it has long been established that the "regular" grade was most effective, as opposed to higher converted types.

Previous investigators such as Duck and Cross, Heiss, Clay, and others have generally agreed that moisture absorption, surface crystallization, and related phenomena that occur to hard candies are functions of the reducing sugar concentration stemming primarily from the mono—and disaccharides of corn syrup and the monosaccharides of invert sugar included in the formulation or formed during processing through hydrolysis of sucrose. Their reportings have suggested that by diluting the hydroscopic reducing sugar concentration through the use of low conversion corn syrup better resistance to surface transitions are obtained.

The manifestations of hard candy deterioration assume several forms. Adsorption of moisture on the surface causes a fluid, sticky film; sugar crystals eventually precipitate, transforming the glassy state into a crystallized one; deformation occurs, proportional to the influence of temperature and adsorbed moisture. These factors bring about changes in color, gloss, shape, and texture which the consumer immediately recognizes as characteristic of "old" candy and rejects it.

The mechanics of these physical changes have been explained by previously mentioned investigators based on objective determinations of contributing factors involving samples prepared in various ratios of sucrose, invert sugar, and/or regular or low D. E. corn syrup held under controlled atmospheres. Generally speaking, they agreed that low conversion corn syrup (also, sometimes referred to as low D. E. or low purity) held out promise of reducing stickiness, lowering moisture adsorption and minimizing surface graining.

Acid hydrolyzed, low conversion corn syrups are not new developments. The technological "know-how" of commercial production has been well established for many years. Certain problems attendant to their manufacture and distribution are recognized, but to a large extent these have been



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satisfactorily resolved, particularly so with those syrups that fall within the upper range of the 28-38 D. E. bracket that classifies low conversion syrups.

Out of consideration to the potential merit of these syrups in hard candy, there appears to be a need for more exploratory work that will broaden the horizons of knowledge in terms of practical conditions incidental to modern manufacturing, packaging, storage, and distribution methods. Our studies were, in a measure, similar to earlier ones, but designed along practical lines for the purpose of drawing conclusions that would permit making specific or generalized recommendations that could be translated into standard production practices. We elected to utilize commercially available low conversion and regular corn syrups having properties set out in Figure 1. Through the courtesy of a wholesale manufacturer and a retail manufacturer, full sized hard candy batches typical of their operations were prepared utilizing conventional formulations, equipment, and procedures. The wholesale test batches were identified and prepared as follows:

**#1 Regular**
300 lbs. granulated sugar
200 lbs. regular 43° corn syrup
9 gals. water

**#2 Low D. E.**
300 lbs. granulated sugar
200 lbs. low D. E. 43° corn syrup
9 gals. water

**#3 Low D. E.**
300 lbs. granulated sugar
250 lbs. low D. E. 43° corn syrup
9 gals. water

The selection of ingredient proportions was based on two factors: the ratio of sugar to regular corn syrup dictated by standard practice as in batch #1 was duplicated with low conversion in batch #2; batch #3 was designed so that the calculated reducing sugar concentration as dextrose corresponded as to percentage of sugar solids with that of batch #1. It was reasoned that in such a manner indications might become evident with respect to how high a proportion of the low conversion syrup to sugar could be utilized without significantly altering consistency, texture, or endangering shelf life.

Premelts were cooked to 238°F. in an open, steam jacketed kettle, and processing was finished in a vacuum cooker operating under 27" vacuum. Batches were mixed in color, flavor, and crystalline citric acid in customary manner, transferred to a batch roller, and formed into hard candy discs which were subsequently wrapped individually in a twisted film.

| **Batch #1 Regular** | **Solids** | **Reducing Sugars** |
|---|---|---|
| 300# sugar | 300 | – |
| 200# 43° reg. corn syrup (43 D. E.) | 160.6 | 69 |
| | 460.6 | 69 |

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{69}{300}\ (100) = \underline{23\%}$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{69}{460.6} = \underline{15\%}$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{160.6}{460.6} = \underline{34.9\%}$$

| **Batch #3 Low D. E.** | **Solids** | **Reducing Sugars** |
|---|---|---|
| 300# sugar | 300 | – |
| 250# 43° low D. E. corn syrup (34 D. E.) | 200 | 68 |
| | 500 | 68 |

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{68}{300}\ (100) = \underline{22.7\%}$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{68}{500}\ (100) = \underline{13.6\%}$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{200}{500} = \underline{40\%}$$

By Contrast, Batch #2 how D. E. calculates as follows:

| | **Solids** | **Reducing Sugars** |
|---|---|---|
| 300# sugar | 300 | – |
| 200# 43° low D. E. corn syrup (34 D. E.) | 160 | 54 |
| | 460 | 54 |

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{54}{300}\ (100) = \underline{18\%}$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{54}{460}\ (100) = \underline{11.8\%}$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{160}{460} = \underline{34.8\%}$$

The manufacturing retailer, as standard practice, made hard candy by open fire method, cooking to an end point of 312°F. Test batches were prepared in the same manner and involved production of pulled stick candy, using in one case the same ratio of low D. E. corn syrup solids to sugar solids as called for in the standard formulation with regular corn syrup; in another case the ratio of low D. E. solids to sugar solids was increased.

**Batch A**
**Cinnamon Stick**
16 lbs. sugar
4 lbs. reg. 43° corn syrup
3 qts. water

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.38}{16} = 8.6\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.38}{19.2} = 7.2\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{3.2}{19.2} = 16.7\%$$

**Batch B**
**Cinnamon Stick**
16 lbs. sugar
4 lbs. low D. E. 43° corn syrup
3 qts. water

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.1}{16} = 6.9\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.1}{19.2} = 5.7\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{3.2}{19.2} = 16.7\%$$

**Batch C**
**Cinnamon Stick**
15 lbs. sugar
5 lbs. low D. E. 43° corn syrup
2½ qts. water

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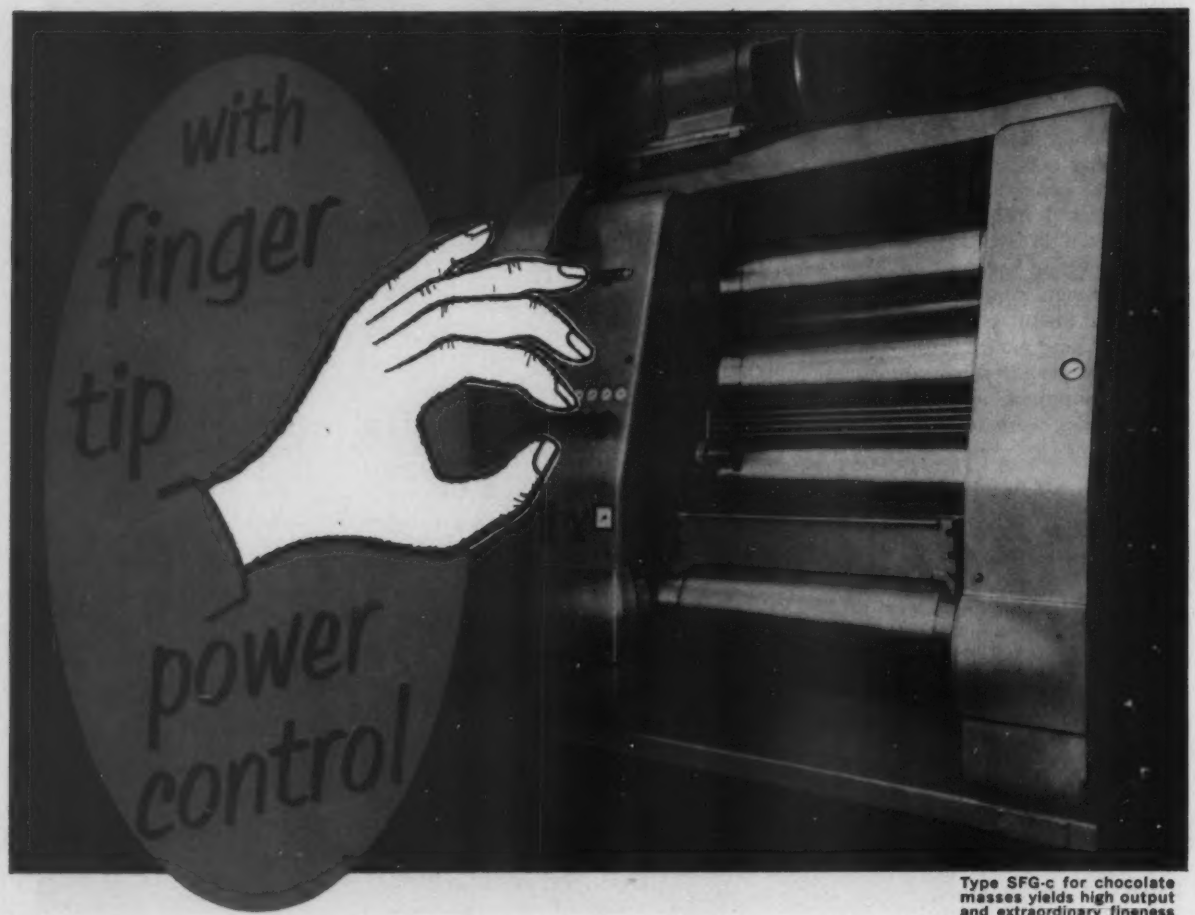


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$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.36}{15} = 9.1\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.36}{19} = 7.1\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{4}{19} = 21.0\%$$

**Batch D**

**Peppermint Stick**
12 lbs. sugar
3 lbs. reg. 43° corn syrup
1½ qts. water

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.38}{16} = 8.6\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.38}{19.2} = 7.2\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{3.2}{19.2} = 16.7\%$$

**Batch E**

**Peppermint Stick**
12 lbs. sugar
3 lbs. low D. E. 43° corn syrup
1½ qts. water

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.1}{16} = 6.9\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.1}{19.2} = 5.7\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{3.2}{19.2} = 16.7\%$$

**Batch F**

**Peppermint Stick**
11 lbs. sugar
4 lbs. low D. E. 43° corn syrup
1¼ qts. water

$$\frac{\%\ \text{Reducing Sugars}}{\text{Sugar Solids}} = \frac{1.1}{11} = 10\%$$

$$\frac{\%\ \text{Reducing Sugars}}{\text{Total Solids}} = \frac{1.1}{14.2} = 7.7\%$$

$$\frac{\%\ \text{Corn Syrup Solids}}{\text{Total Solids}} = \frac{3.2}{14.2} = 22.5\%$$

After the spun and cut sticks had cooled to room temperature, they were slipped into cellulose film wrappers with twist closure.

Samples of all batches were held under a variety of conditions, wrapped and unwrapped, and periodically examined by subjective and objective tests. A resume of results objectively determined is shown in Fig. 2.

The increase of reducing sugars in samples 1, 2, and 3 is of interest. Although the ratio of sugar solids to total solids was the same in 1 and 2, slightly more sucrose (about 1+%) was inverted during processing in batch 1. Inversion proceeded at a remarkably low rate in batch 3 which may be explained, in part at least, by the smaller fraction of sugar solids to total solids.

**Fig. 2**

| Sample Designation | Initial Moisture Content % | Reducing Sugar Content as Dextrose on Dry Basis, % Calc. from Formula | Observed in Candy | pH |
|---|---|---|---|---|
| 1 | 1.27 | 15.0 | 23.2 | 2.2* |
| 2 | 2.15 | 11.8 | 18.7 | 2.3* |
| 3 | 2.14 | 13.6 | 15.7 | 2.3* |
| A | 2.12 | 7.2 | 13.9 | 4.6 |
| B | 2.66 | 5.7 | 9.4 | 4.6 |
| C | 2.47 | 7.1 | 11.6 | 4.4 |
| D | 2.44 | 7.2 | 9.1 | 4.8 |
| E | 2.69 | 5.7 | 7.8 | 4.7 |
| F | 3.57 | 7.7 | 10.3 | 4.7 |

*Acidulated with citric

Since moisture adsorption is the primary motivating factor that brings about surface phenomena and the amount adsorbed is directly proportional to the extent of change, samples of each test batch were held in bell jars, at room temperature, over sulfuric acid solutions of such concentrations as to provide constant relative humidities of 40, 60, and 80%, and periodic weighings made to determine moisture adsorption. From time to time, each type was examined for evidences of change in color and form. The quantitative analytical results are shown in Fig. 3.

Hydroscopicity of the various candies is illustrated dramatically in Fig. 3. There is a consistent increase in moisture pickup with increasing percentage of reducing sugars. However, at 40% RH there was virtually no change in weight. At 60% RH most samples were affected to only a minimal degree but, nonetheless, in some cases enough to bring about surface changes.

A summary of subjective observations over a period of 55 days indicates that at 40% RH virtually no changes from original state occur. At 60% RH the original quality has been altered to some extent, but generally all samples would be considered saleable, except sample A where some color was striking through the stripes. This had the highest reducing sugar content, 13.9%, of all the stick candy samples, and because of the contrasting color combination (red and white), would be more susceptible to visual differentiation. As might be expected, exposure to 80% RH caused severe deterioration of such magnitude that none of the candies could be called acceptable; but, nevertheless, those containing lower concentrations of reducing sugars

**Fig. 3**

| Sample Designation | Reducing Sugar Content, % Dry Basis | % Moisture Absorption 8 Days 40 RH | 8 Days 60 RH | 8 Days 80 RH | 12 Days 40 RH | 12 Days 60 RH | 12 Days 80 RH | 24 Days 40 RH | 24 Days 60 RH | 24 Days 80 RH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23.2 | – | .27 | 3.47 | – | .42 | 4.76 | – | .48 | 6.08 |
| 2 | 18.7 | – | .18 | 1.75 | – | .29 | 2.33 | – | .34 | 2.92 |
| 3 | 15.7 | – | .11 | 1.68 | – | .18 | 2.25 | – | .21 | 2.83 |
| A | 13.9 | .007 | .23 | 1.84 | .006 | .29 | 2.39 | .004 | .31 | 3.14 |
| B | 9.4 | – | .06 | 1.11 | – | .08 | 1.43 | – | .09 | 1.86 |
| C | 11.6 | – | .18 | 1.36 | – | .20 | 1.81 | – | .21 | 2.34 |
| D | 9.1 | – | .08 | 1.60 | – | .14 | 2.23 | – | .14 | 2.65 |
| E | 7.8 | – | .01 | 1.07 | – | .002 | 1.54 | – | – | 1.95 |
| F | 10.3 | – | .01 | 1.25 | – | – | 1.71 | – | – | 2.2 |

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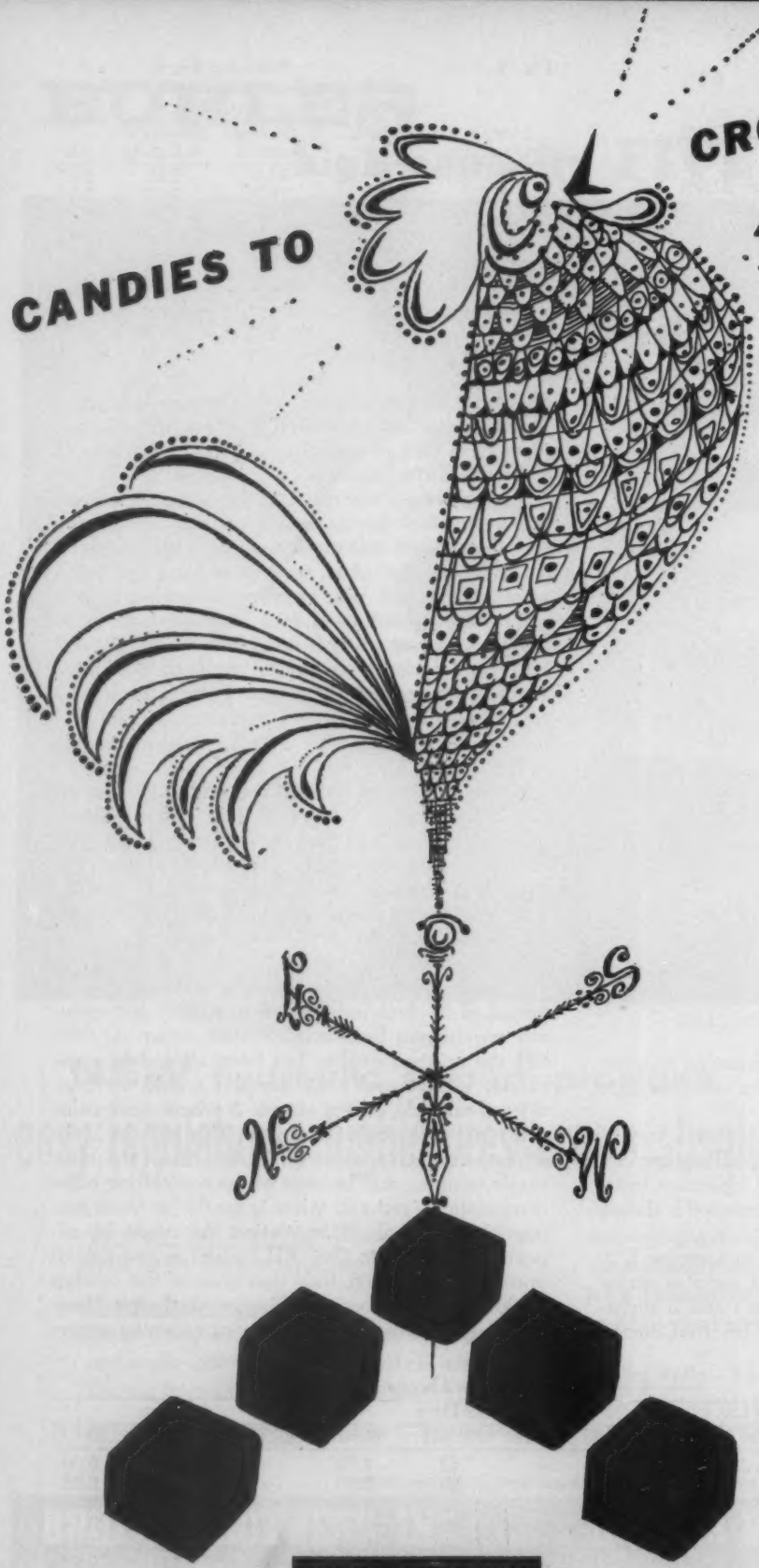


CORN PRODUCTS DIVISION
CORN PRODUCTS SALES COMPANY

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at least retained their original forms and effectively resisted melting down into soft, syrupy masses.

Low conversion corn syrup is characterized by its high viscosity attributable to the concentration of higher saccharides, tetra and above. These fractions may be described as having strong cohesive properties that tend to resist dispersion or separation. When used in hard candy there is evidence to indicate beneficial influences because of this cohesion exemplified by lower rate of solubility and resistance to fracture. When spinning and cutting stick candy batches B, C, E, and F that involved low conversion syrup, less breakage occurred, resulting in a smaller amount of scrap. To check this observation more accurately, the hard candy discs made according to batches 1, 2, and 3, and another set prepared with the same type and same ratio of ingredients, except cooked in an open fire laboratory kettle, were subjected to a rather violent horizontal reciprocating action in a closed cylinder for a given length of time. The nature and extent of breakage was then determined by weighing the whole or essentially whole pieces, the portion that remained on a 20 mesh sieve, and the portion that passed through 20 mesh. These portions were then expressed as percentages of initial weight.

Concurrent with that study, another experiment was designed to evaluate differences in rate of solubility by immersing duplicate sets of hard candy discs in mildly agitated 120°F. water and noting the time required for each to completely dissolve.

Results are tabulated in Fig. 4.

Fig. 4

| Sample Designation | Time Required to Dissolve, minutes | Breakage % Whole | % on 20 | % passed 20 |
|---|---|---|---|---|
| 1 | 17.2 | 97.60 | 1.00 | 1.40 |
| 2 | 17.3 | 98.88 | 0.23 | 0.89 |
| 3 | 17.9 | 99.35 | 0.10 | 0.55 |
| 1 (L) | 29.6 | 95.86 | 2.48 | 1.66 |
| 2 (L) | 31.9 | 96.79 | 2.02 | 1.19 |
| 3 (L) | 33.9 | 96.79 | 1.85 | 1.36 |

(L) Made in laboratory.

With particular reference to the commercially made orange hard candy discs (Batches 1, 2, and 3), some further observations require reporting. The intensity of color in sample 1 was darker than samples 2 and 3 when fresh, as well as after aging. This could be due to an inaccuracy in color addition, or because of more aeration while working batches 2 and 3 on a Berks mixer. These were stiffer than batch 1 and tended to set up more rapidly.

After a period of aging at room temperature and humidity, samples from batch 3 developed in an inconsistent manner—light colored agglomerates at or near their surfaces which detracted from appearance. The patches were similar to a "graining" effect but showed up in a random pattern, as opposed to a uniform surface transition brought about by redeposition of sugar crystals. Moreover, these agglomerates appeared to be amorphous in character and gave a slight reddish-brown reaction with iodine test solution that suggested a very high molecular weight polysaccharide.

The onset of stickiness as determined by resistance to pulling away of a cellulose film wrapper was lowest for sample 2, closely followed by 3, and greatest in sample 1.

A summation of results leads us to believe that low conversion corn syrup when discreetly utilized in conventional hard candy formulations functions in an equivalent manner to regular corn syrup from the standpoint of furnishing a mixed carbohydrate system which, when combined with sucrose, will exhibit a similar order of stability in the "glassy" state. Because of its lower reducing sugar concentration, less moisture is adsorbed at the higher relative humidity range affording added protection against changes that are motivated by the moisture factor. This suggests the possibility of safely storing and shipping under less rigidly controlled atmospheres which is of economic importance.

An abnormally high ratio of low conversion syrup to sugar may cause surface changes akin to graining, even under ideal storage conditions, and does not appear warranted for at least certain types of clear hard candies. Cohesiveness or toughness imparted may serve to reduce friability with attendant lowering of broken or damaged pieces in the course of normal production practices.

The preferential dextrose equivalent value within the range that classifies low conversion syrup has not been established. This can best be determined by individual appraisal of hard candy type, formulation, processing procedure, and environmental conditions of storage and distribution.

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# YOUR CANDY UNDER ATTACK!

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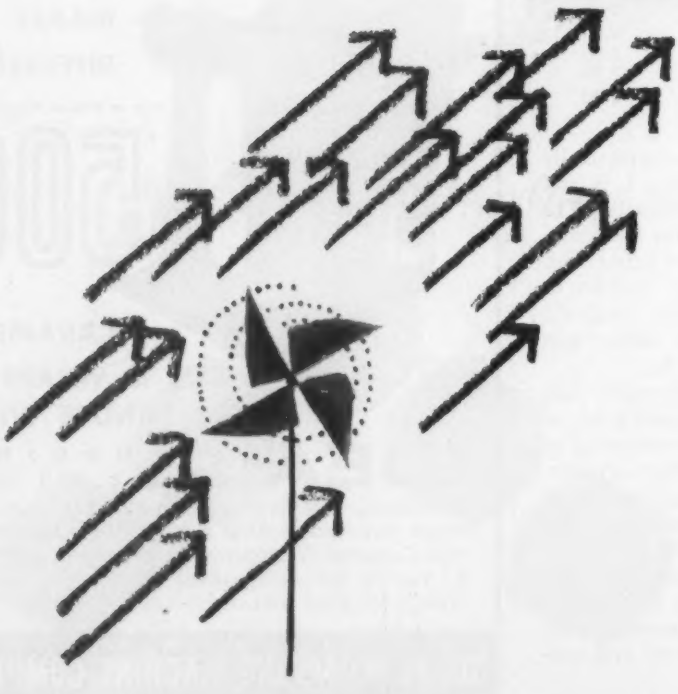

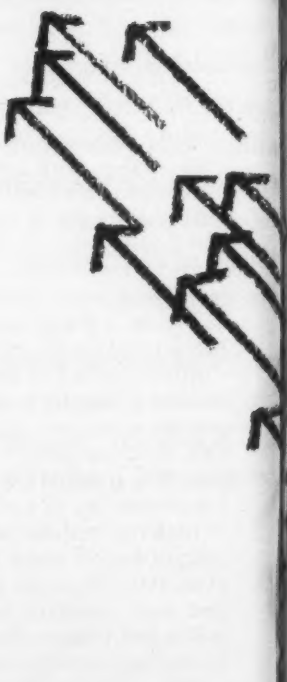

. . . and relentless are its enemies that work to destroy the shelf appeal, freshness and customer satisfactions that you build into your product. Are you still trusting the sales life of your product to a single so-called "all purpose" packaging material?

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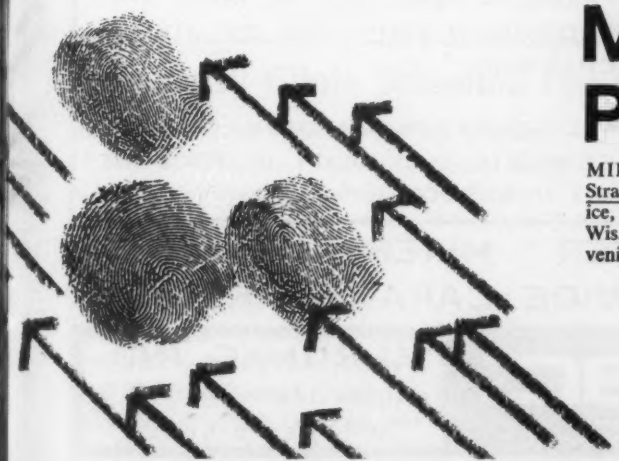

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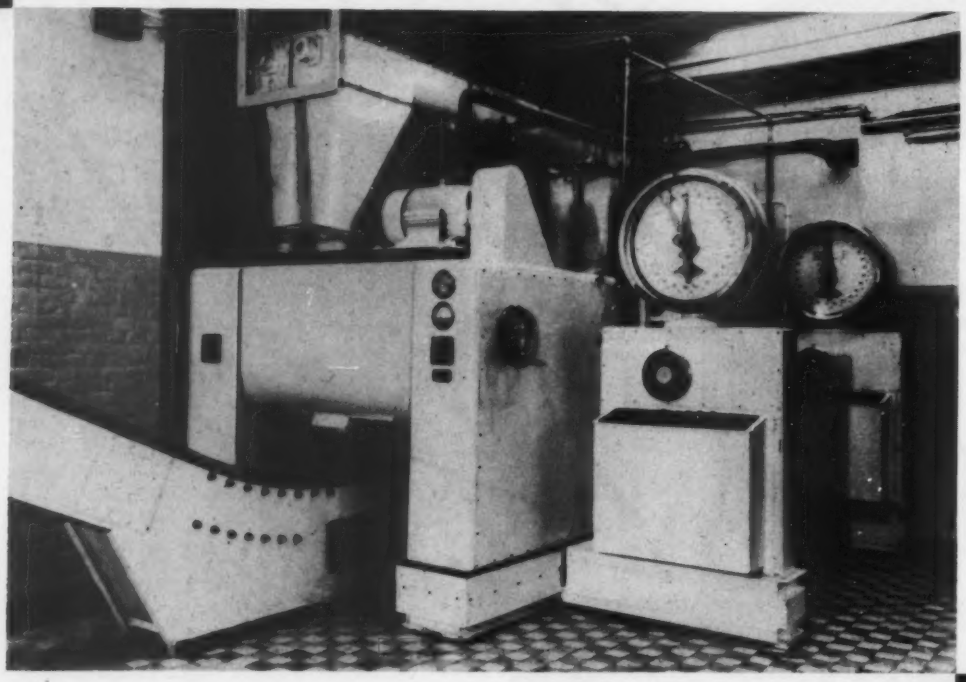
# DO YOU
# MIX AND KNEAD AUTOMATICALLY?



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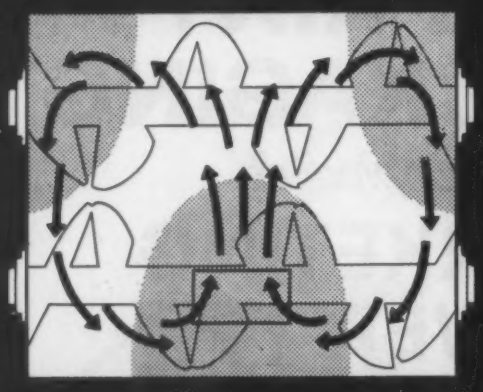

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1. MASS IS ALTERNATELY MIXED AND COMPRESSED MAKING POSSIBLE A VERY SHORT MIXING CYCLE.
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The MANUFACTURING CONFECTIONER'S

# Candy Clinic

The Candy Clinic is conducted by one of the most experienced superintendents in the candy industry. Some samples represent a bona-fide purchase in the retail market. Other samples have been submitted by manufacturers desiring this impartial criticism of their candies, thus availing themselves of this valuable service to our subscribers. Any one of these samples may be yours. This series of frank criticisms on well-known branded candies, together with the practical "prescriptions" of our clinical expert, are exclusive features of The MANUFACTURING CONFECTIONER.

## Easter Candies; Cordial Cherries

### Code 5M60
### Chocolate Covered Cherries
### ½ lb.—$1.45
(Purchased in a department store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Square box, one layer type, slip cover. Black glazed paper top, overall print of name etc. in pink, blue, white, red and green. Imprint of fruit in colors.
**Appearance of Box on Opening:** Good. Cherries have stems, none were broken.
**Number of Pieces:** 20
**Chocolate:** Dark
- **Color:** Good
- **Gloss:** Fair
- **Taste:** Good

**Center:**
- **Cordial:** Good
- **Cherry:** Good
- **Flavor:** See remarks

**Remarks:** A good eating cordial cherry, one of the best we have examined this year. Suggest a good cherry flavor be used to improve the flavor of the cordial. Package should be wrapped in cellulose.

### Code 5L60
### Chocolate Covered Cherries
### All Liquid Centers
### 11½ ozs.—89¢
(Purchased in a department store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Oblong box, one layer type. White glazed paper top printed in green. Imprint of cherries in brown and red. Cellulose wrapper printed in blue.
**Appearance of Box on Opening:** Good
**Number of Pieces:** 20
**Piece:** Piece is made on a machine similar to a shell machine
**Chocolate:Light**
- **Color:** Good
- **Gloss:** Good
- **Molding:** Good
- **Taste:** Good

**Center:** All liquid
- **Cherry:** Good
- **Liquid Flavor:** See remarks

**Remarks:** A very fine eating cordial cherry; the best cherry of this kind we have examined this year. Suggest a good cherry flavor be added to the liquid to improve the flavor.

### Code 5R60
### Chocolate Covered Cherries
### ½ lb.—$1.60
(Purchased in a retail candy shop, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Long oblong box, one layer type. White glazed paper top printed in red and green and brown. Imprint of cherry cluster in colors. White paper wrapper overall print of name in gold.
**Appearance of Box on Opening:** Good
**Number of Pieces:**
- **Light Coated:** 8
- **Dark Coated:** 8

**Coatings:**
- **Colors:** Good
- **Gloss:** Good
- **Strings:** Good
- **Taste:** Good

**Centers:** Pineapple and cherries
- **Cordial:** Good
- **Pineapple & cherries:** Good
- **Flavors:** See remarks

**Remarks:** Suggest that good pineapple and cherry flavor be added to the cordial to improve the flavor.

## Candy Clinic Schedule For the Year

**JANUARY—Holiday Packages; Hard Candies**
**FEBRUARY—Chewy Candies; Caramels; Brittles**
**MARCH—Assorted Chocolates up to $1.15**
**APRIL—$1.20 and up Chocolates; Chocolate Bars**
**MAY—Easter Candies; Cordial Cherries**
**JUNE—Marshmallows; Fudge**
**AUGUST—Summer Candies**
**SEPTEMBER—Uncoated & Summer Coated Bars**
**OCTOBER—Salted Nuts; Gums & Jellies**
**NOVEMBER—Panned Goods; 1¢ Pieces**
**DECEMBER—Best Packages and Items of Each Type Considered During the Year.**

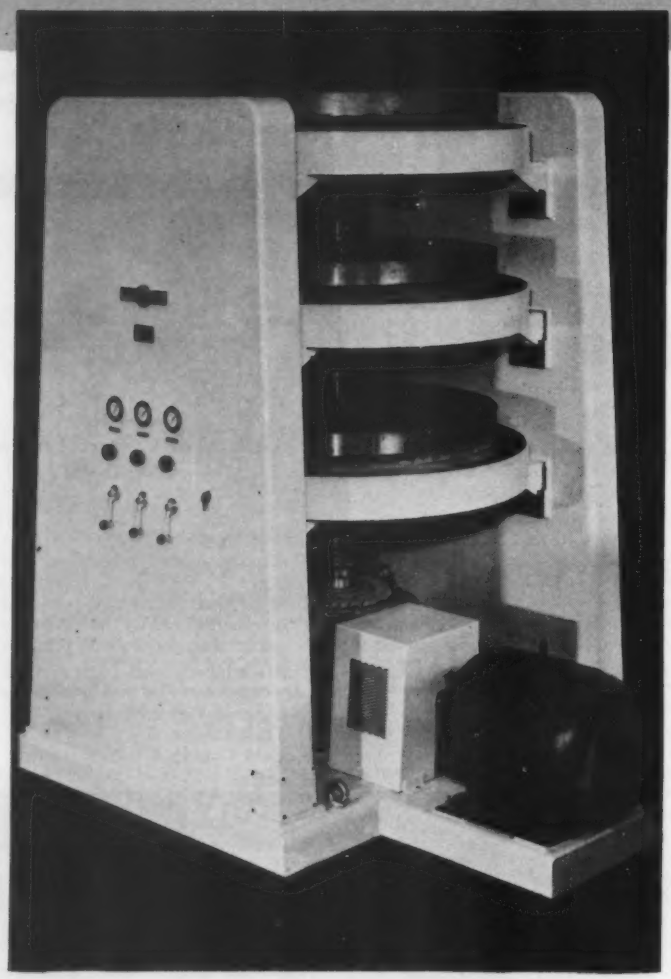
### Code 5S60
### Sugar Mints
### 6½ ozs.—39¢
(Sent in for analysis)

**Appearance of Package:** Good for this type of confection.
**Container:** Long oblong folding box. Window on top and one side. White board printed in red and yellow stripes.
**Wafers:**
- **Colors:** Good
- **Gloss:** None
- **Texture:** Good
- **Mint Flavor:** Fair

**Remarks:** A good eating mint but lacked flavor. This type of confection should have a good strong mint flavor or any other flavor that is used. Very highly priced at 39¢ for 6 1/2 ozs.

# The LEHMANN TRIPLE COCOA LIQUOR MILL

## sets *new* performance standards



Field tests on this new mill reveal substantially improved performance as compared with earlier types of cocoa liquor mills. The ground liquor discharges from the mill at temperatures 40° to 50° F. lower, due to a newly designed cooling system. Fineness of grind and production rate are increased because of the higher viscosity at the lower grinding temperatures.

Adjustment of the mill is completely automatic. Pressure gauges regulate settings for repetitive operation. The profile of the machine has been radically streamlined, all non-functional pockets, projections, etc., having been eliminated. Its cleancut lines make the machine easier to clean—an important factor because of increasingly strict public health laws. In this mill, also, noise and vibration are greatly reduced as compared with earlier designs.

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**550 NEW YORK AVENUE, LYNDHURST, N. J.**


### Code 5N60
### Chocolate Covered Cherries
### ½ lb.—$1.95

(Purchased in a retail candy shop, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Oblong box, one layer type. Pink glazed paper top, overall imprint of windmills and fruit in colors. White paper wrapper, overall print in blue of fruits and windmills, tied with blue twine.
**Appearance of Box on Opening:** Bad. See remarks.
**Number of Pieces:** 17
**Coating:** Light Chocolate
- **Color:** Good
- **Strings:** Good
- **Gloss:** Fair
- **Taste:** Good

**Center:**
- **Cordial:** Good
- **Cherry:** Good
- **Flavor:** See remarks

**Remarks:** There were four broken pieces and the cordial was all over the liner and other pieces, also in the bottom of the box. Suggest a crate divider be used to avoid breaking. Suggest a good cherry flavor be added to the cordial to improve the flavor. Highly priced at $1.95 for ½ pound.

---

### Code 5J60
### Chocolate Covered Cordial Cherries
### 12 ozs.—59¢

(Purchased in a chain variety store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** White folding box, two layer type. Oval window on top. Printed cellulose wrapper in red, white and green. Imprint of cherry clusters in colors.
**Appearance of Box on Opening:** Good
**Number of Pieces:** 20
**Coating, Dark Chocolate:**
- **Color:** Good
- **Gloss:** Good
- **Strings:** Good
- **Taste:** Good for this priced cherries

**Center:**
- **Cordial:** Good
- **Cherry:** Good
- **Flavor:** Good

**Remarks:** The best chocolate covered cherries we have examined at this price.

---

### Code 5O60
### Milk Chocolate Solid Eggs
### 4 ozs.—39¢

(Purchased in chain variety store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Cellulose bag, white paper clip printed in red and blue. Eggs are wrapped in colored foil.
**Eggs:**
- **Chocolate:** Good
- **Molding:** Good
- **Foiling:** Good
- **Taste:** Good

**Remarks:** A good eating and attractive small milk chocolate egg. The best we have examined this year.

### Code 5P60
### Panned Coconut Cream Eggs
### 12 ozs.—29¢

(Purchased in chain variety store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Polyethylene bag printed in maroon and yellow.
**Eggs:**
**Sprinkled Colors:** Good
**Panning:** Good
**Molding:** Good
**Finish:** Good
**Center:**
**Color:** Good
**Texture:** Good
**Taste:** Good
**Remarks:** The best panned coconut cream eggs we have examined this year in this price field.

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### Code 5Q60
### Chocolate Covered Cherries
### 13 ozs.—49¢

(Purchased in chain drug store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Oblong box, two layer type. Top printed in red, white, gray, yellow and green. Imprint of cherries in colors. Cellulose wrapper.
**Appearance of Box on Opening:** Good
**Number of Pieces:** 20
**Coating:** Dark Chocolate
**Color:** Good
**Gloss:** Good
**Strings:** Good
**Taste:** Good for this priced cherries
**Center:**
**Cordial:** Good
**Cherry:** Good
**Taste:** Good
**Remarks:** One of the best cordial cherries we have examined this year in this price field.

*Continued on Page 57*

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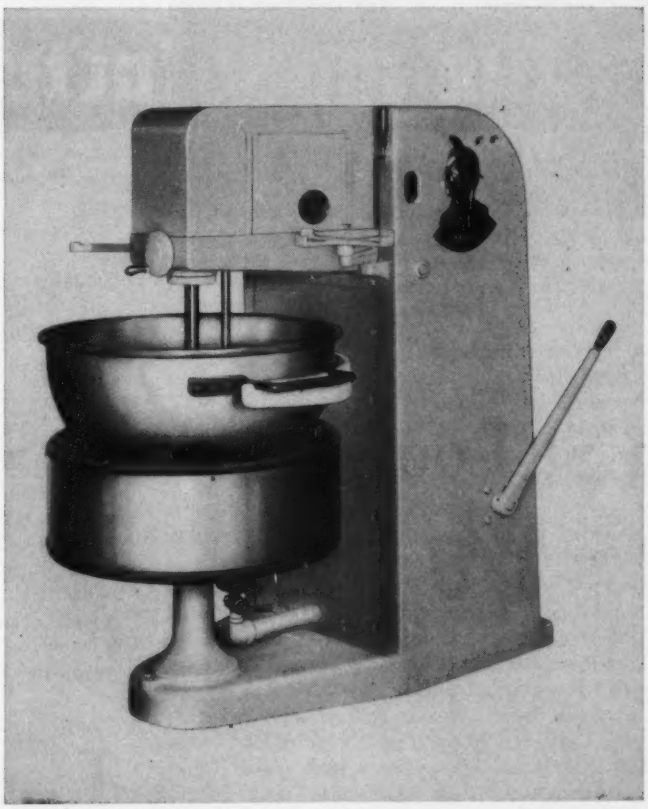
# SAVAGE LATEST FIRE MIXER

**MODEL S-48**

**Thermostatic Gas Control—Variable Speed**



The Savage Latest Fire Mixer, Model S-48, is Streamlined and Sanitary and has many new features and conveniences:

Automatic Temperature Control
Variable Speed from 30 to 60 RPM
Break-back within floor space 32" x 48"
Aluminum Base and Body Castings
Atmospheric Gas Furnace with Stainless shell
Removable Agitator, single or double action
Stainless Cream Can and Stainless Drip Pan
Copper Kettle 24" diameter 12½" deep or 16" deep

You can save labor and obtain uniform batches by setting the thermostat for degree cook desired. It cooks and mixes batches of caramel, peanut brittle, peanut candies, fudge, nougat, gum work, and with double action agitator is ideal for coconut candies and heavy batches.

Your inquiry invited

# SAVAGE BROTHERS COMPANY

**2638 Gladys Ave. Chicago 12, Ill.**

## the manufacturing retailer

# In St. Louis it's Amy Smith Candies

Three generations of Smiths posed in their St. Louis candy shop. From left to right: Donald J. Smith, Con Smith and William Smith (founder of the company).

It was one specially devised recipe which gave the impetus for the founding and success of Amy Smith Candies in St. Louis 35 years ago. The specialty remains one of the best sellers today.

The recipe for Peanut Crisp was dreamed up by William Smith who started his candy career at the age of 17 and went systematically about learning everything there was to know about candy manufacture. Now, 55 years later, he is still keenly alert to innovations but rejects any and all which he feels lessen the quality of his candy. He commenced making top grade confections, his whole career has been predicated on that premise and he will not give an inch. Such determination put his company in a leading position of manufacturing retailers in the St. Louis area.

Mr. Smith worked for various wholsale manufacturers in St. Louis to learn to make, to roll, to dip and to package all types of confections. He journeyed to Chicago to work at Bunte Brothers to learn the candy field and when he felt himself ready he returned to St. Louis to begin as a manufacturer. After three years he opened a concession in the early twenties at a leading restaurant so that he might obtain retail experience.

In March 1925 he and his wife and son, Con, opened a shop in downtown St. Louis but a whisper away from the largest department store. In line with

the then current custom of using women's names for candy, the new business was named for Mrs. Smith.

Co-incident with the opening, they selected 500 residents and sent each a one-pound box of Peanut Crisp. This was so effective that they were easily and successfully launched. Customers still come in to buy the product who can remember receiving the introductory box and who have been buying Peanut Crisp ever since.

Peanut Crisp is thickly coated with chocolate and formed into blocks. It is packed five bars to the pound and sells for 69 cents. Because of its delicate brittleness, it will not stand shipping. Since Mr. Smith holds the secret of its preparation, he claims it cannot be duplicated elsewhere and is therefore a totally local product.

Smiths is probably one of the few companies carried on by three generations. Con Smith's son, Donald J., is the shop manager while William and Con concern themselves with the manufacture and packaging.

The first shop had an 18 foot front and was about one-half block deep. It rapidly became too small and six years later it was moved several doors away to double the capacity. A tea room was opened in conjunction. It became immediately popular for shoppers and business people alike but the era was wrong. It was on the eve of the end of prohibition and the popularity for tea room type of dining receded. By 1947, ebb tide was reached in tea room favor and labor problems mounted. The Smiths decided they would return to the candy business exclusively.

They moved the company to 415 N. Eighth Street which is almost next door to a major downtown hotel, across the street from a leading bank, but a short block from the business center and the heaviest shopper traffic. It was the best decision they ever made, the Smiths agree. Old customers followed and to these were added new customers such as business executives and much transient trade.

The show window runs almost across the entire facade with the entrance at the side. The retail

**William Smith is shown working on a batch of Peanut Crisp which is the specialty of this manufacturing retailer.**

**Kate Poullain has been with Amy Smith Candies for ten years. Some of the other employees have been with the firm since it opened for business in 1925.**

store space is 22 by 50 feet with the factory behind and on a basement level running a full block deep. The shop is beautifully mirrored on all sides with handsomely grained walnut cases for wall display and counters. Eleven imported glass chandeliers light the entire shop and the general impression is of mid-Victorian splendor and taste.

The back bar cases are of walnut, mirrored, and the product displays are interspersed with intriguing objects d'art that have been accumulated through the years. The center aisle has several tables with candy compotes, seasonal objects and opened boxes showing the various assortments. This display is pretty well duplicated along the opposite wall where a walnut counter is set off by a mirrored background. The color of the candles in compotes, candy dishes and porcelains in muted shades produces an harmonious and inviting effect.

The Smiths make 90 per cent of all their candies which consists of a full line of light and dark chocolates. They buy only a few jellies, licorice, fruit slices and gum drops. The factory is equipped with some new but mostly old, time-honored and beloved equipment which they believe serves them better. They have copper kettles, Reed mixer, Ball cream beaters, marble slabs and use open fire candy cooker and mixer. They do not use enrobers nor depositors and they prefer hand roll to machine method. All of their chocolates are lavishly coated and all are hand dipped. Theirs is one of the few companies in the area using this method preferring the standard of consistency and taste that they find can thus be maintained.

Some of the employees have been with the company since it opened and still others have been personally trained by the senior Mr. Smith. He deplores the fact that tempo of life today makes it more and more difficult to entice trainees into the field.

Practically all their items are boxed. The most popular is a full assortment with 21 different centers that sells for $1.60 per pound. Other leaders are the $1.45 assorted creams; nut and fruit chocolates at $2; assorted nut centers at $2.50 and, of course, the ever popular Peanut Crisp. They are packed in one,

two, three and five pounds with the one and two being the greatest sellers.

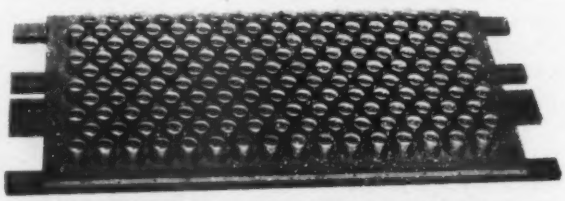
Dipping takes place on the basement level where there are walk-in coolers for this work and for storage. Packaging is done in coolers on the lower level with the exception of select packaging requested in the shop. There is a large walk-in cooler for this purpose located at the division line between the shop and the factory. Storage space is on the balcony between first and lower levels. Mr. Smith is generally credited with installing the first refrigerated counters in the entire area.

The Smiths are as great sticklers for freshness as they are for skill and timing in candy manufacture. Therefore, they prefer to keep inventory just a comfortable margin ahead of demand. This requires dedication of time and merchandising experience. But, they succeed in maintaining their reputation for quality and freshness by virtue of this application to business and principle. Only in advance of the Christmas and Easter seasons do they at any time package a large stock, possibly four to five weeks ahead.

William and Con scrutinize every detail of purchase and deal mostly with suppliers who have served them for several decades. They follow through from raw materials through each phase of preparation until time to turn it over to Donald for display and sale.

So well-known and strategically located is their shop, the company has very little need for additional advertising. Window displays are their chief messages to the heavy foot traffic which passes their shop. Donald is the genius behind this. His displays are keyed to seasonal promotions and are completely redone each week to attract attention and keep interest up as to "what will they think of next." St. Louis is beset as are many large cities with outlying shopping centers and trek to the country movement. As yet this has not affected their business appreciably. They are keeping a wary eye out and should the trend take an even sharper curve away from the downtown area, they will be ready to jump.

The elder Mr. Smith, yearned from the first day of his connection with the candy world, now well over a half a century ago, to have his own manufacturing concern. That he has achieved it, made a success of it and not relinquished a single iota of his high standards makes him a proud and happy man.

**ALUMINUM CANDY MOULD PATTERNS**
for use with mogul starch equipment

We are now using the new hard burnished finish which eliminates the break-in period. They pay for themselves in a few weeks.

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# Olin Brown's Bee Hive

By Olin Brown
Stratford, Ontario, Canada

We make a one-ounce piece that we call a Cherry Dip or a Walnut Dip in which we use a special metal mold shaped like a bee hive. Eight impressions two inches high, two inches in diameter, are in each mold.

We fill the molds with the best quality chocolate, either light or dark, then immediately empty them, leaving a chocolate shell. The mold is then placed in our cold room for about twenty minutes.

At room temperature we drop a 1200-1400 count maraschino cherry, or a walnut, into each shell while still in the mold and we press hand roll vanilla or butter cream into each shell until full. Using a funnel we cover this with more chocolate, bounce the mold a couple of times to smooth the bottom, and we put it in the cold room (42 degrees) for another twenty minutes.

After this time they are ready to be dumped out of the mold and wrapped in cellophane.

We find this piece to be an excellent theatre item and generally sell them at 10 cents apiece.

**24 HOURS A DAY**

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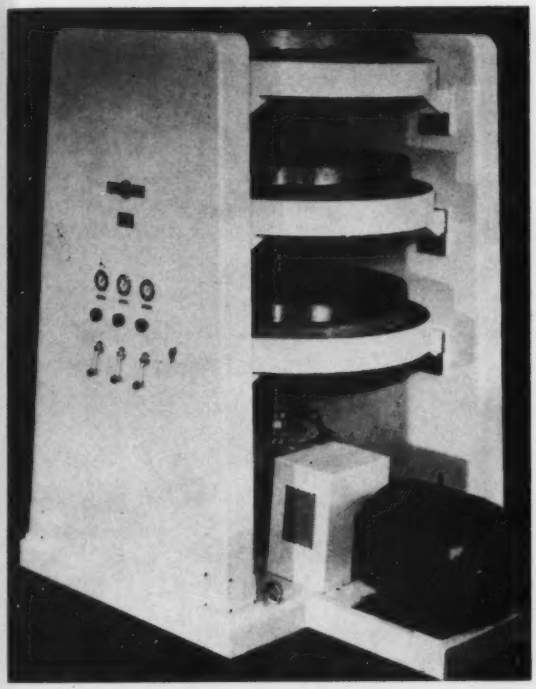
And with confections, it's quality ingredients that count. Clinton corn syrups provide added body, improved texture and shelf life. Why not try Clinton corn syrups today?

**CLINTON TECHNICAL SERVICE** is freely available upon request.

CLINTON

**CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA**

# New Products



**A new triple cocoa liquor mill** has been introduced which discharges ground liquor at temperatures lower by 40° to 50°F. due to a newly designed cooling system. Fineness of grind and production rate are increased because of the higher viscosity at the lower grinding temperatures. Adjustment of the mill is completely automatic, simplification of design makes it easier to clean and operating noise and vibration has been greatly reduced in the new mill.

*For further information write: J. M. Lehmann Co., Inc., Lyndhurst, New Jersey.*

**An oil resistant ink system** has been developed which will allow polyethylene bags for oily products to be printed in as many as five colors. Sold at no extra charge over regular ink systems the oil-resistant ink prevents loosening or softening of ink. Tests have shown that the new ink formulation can be used on polyethylene bags, which stored under normal conditions will show none of the deterioration common to bags printed with standard inks and containing oily products.

*For further information write: Continental Can Company, 100 East 42nd Street, New York 17, New York.*


Make the vanilla
TASTE TEST

Vanilla bean costs are climbing . . . Planifoline (from plant extractions only) is today's quality-economy answer to your vanilla formulations . . . no artificial color added.

Make the COST TEST

Make the taste test . . . the cost test . . . and you'll decide on Planifoline . . . available in one to 10-fold concentrates, oleoresins, and imitation vanilla sugars of varied strengths.

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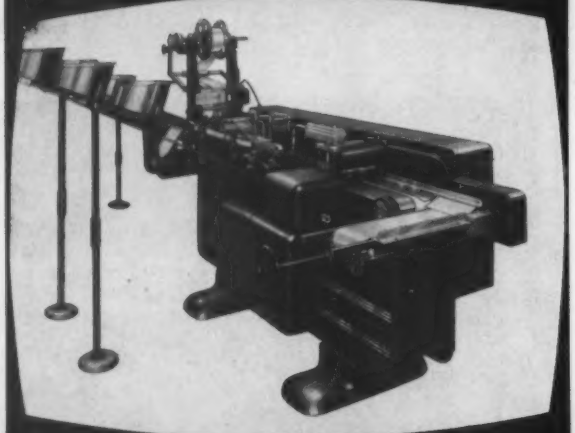
Stop at Florasynth's Exhibit (Booth No. 24, 25) Institute of Food Technologists annual meeting May 18-19, Masonic Temple, San Francisco, Calif.

**HUDSON SHARP'S**
**new and improved**

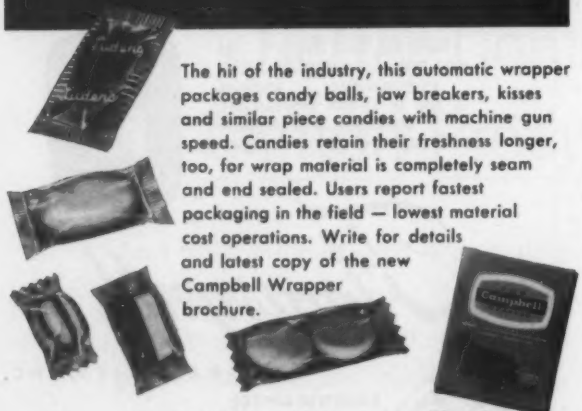
FMC
**Campbell**
WRAPPER

# *Wraps and Seals up to 650 Piece Candies — per minute!*

- Wraps and seals without twisting ends
- Saves up to 35% in wrap materials
- Wraps single or multiple pieces per unit



- Wraps with glassines, wax papers, cellophane, foils and other materials
- Heat or and glue sealing
- Hopper or conveyor-type machine infeeding
- Wraps candies of any shape or size
- Wraps hard, soft, crisp or fragile candies without crush or breakage
- Saves labor with 1 person operation



The hit of the industry, this automatic wrapper packages candy balls, jaw breakers, kisses and similar piece candies with machine gun speed. Candies retain their freshness longer, too, for wrap material is completely seam and end sealed. Users report fastest packaging in the field — lowest material cost operations. Write for details and latest copy of the new Campbell Wrapper brochure.

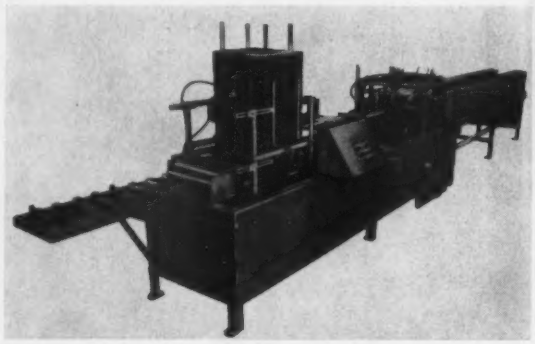
*Putting Ideas to Work*

fmc

FOOD MACHINERY AND CHEMICAL CORPORATION
**FMC Packaging Machinery Division**
Hudson-Sharp Machine Company
1201 MAIN STREET • GREEN BAY, WISCONSIN

**A special silicone coating** for the inside of multi-wall bags has been developed which prevents adhesion of the bag to the material being packed. The coating cannot contaminate the packaged product and remains inert. In addition, it does not migrate through the stock and will not transfer even under prolonged heat and pressure. It is odorless and colorless and does not change the appearance or basic characteristics of the stock. With this coating it is possible to ship or store tacky materials for extended periods of time without paper adhering to the products.

*For further information write: Olin Mathieson Chemical Corporation, 460 Park Avenue, New York 22, N. Y.*



**A new casing machine** has been introduced which will automatically open, erect, load and seal at speeds up to 25 per minute. A wide range of package types and sizes can be cased and practically any rigid or semi-rigid container can be handled.

*For further information write: FMC Packaging Machinery Division, Stokes & Smith Plant, 4992 Summerdale Ave., Philadelphia 24, Pa.*

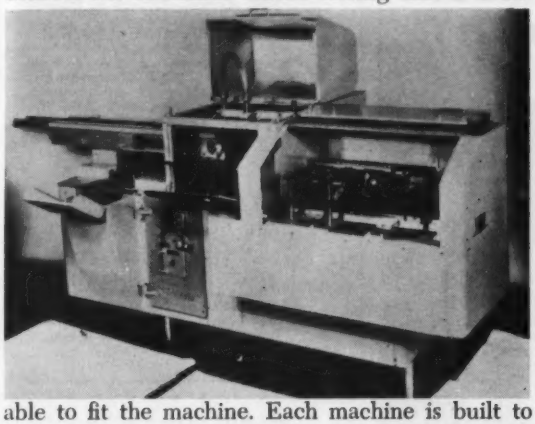
**A machine which will package wax-wrapped candies** has been introduced. This automatic unit will count and package lollipops to a plus one, minus zero accuracy at the speed of 30 bags per minute. Pre-wrapped caramels run through at 35 bags a minute. Nearly all heat-sealable materials can be used and forming, weighing, filling and sealing are accomplished in one operation, requiring only one overseer.

*For further information write: Mercury Heat Sealing Equipment Co., 2601 North Howard Street, Philadelphia 33, Pa.*

**A Teflon coated glass endless belt** is now available which has a temperature range from minus 400° F. to plus 600° F. with anti-adhesive and anti-friction properties. It is particularly suitable for situations which require sanitation and ease of release. The belts are dimensionally stable and won't stretch or shrink.

*For further information write: Dodge Fibers Corporation, Hoosick Falls, New York.*

**A carton loading machine** has been developed which is claimed to completely automate the loading of wrapped bars, rolls, or various shapes of candy packs into a top loading type hinged cover carton or open-topped tray. The machine can be tied in with overwrapping machines and carton formers to make an integrated, automatic line if desired. An automatic carton closing unit is available to fit the machine. Each machine is built to handle one size carton within the range of length –3 1/2″ to 13″, width–2 1/2″ to 7″, height 3/4″ to 4″.



Articles can be loaded in up to five or six layers in single row formation. Output of the machine is 60 cartons per minute for a single layer; for a double layer carton output would be 30 per minute, etc.

The product surface must be such that it can be gripped securely by suction and the shape and nature of the product must be such that it can be fed on a moving belt, one unit pushing another over a deadplate in order to have the machine work effectively.

This machine was developed in England by Forgrove Machinery Company.

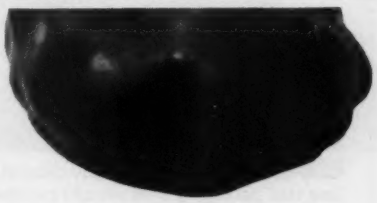
*For further information write the exclusive U. S. agents, Package Machinery Company, East Longmeadow, Massachusetts.*

**A candy wrapping machine** has been introduced which wraps diversified, round, square, rectangular, heart and egg shaped candy products at speeds up to 85 per minute one after another. The machine handles such films as heat-sealing cellophane, foils, glassines, and heat-sealing waxpapers. Code daters, automatic card feeders, labeling units and other additional equipment can be used with the machine.

*For further information write: Crompton & Knowles Packaging Corp., Holyoke, Mass.*

**A versatile new printing and coding attachment** has been developed which when used with special non-smudge inks will print on cellophane, polyethylene, and glassine. It is designed to imprint product description, price information or code dating. It can be fitted with a variety of type faces and can be supplied in various widths.

*For further information write: Bell-Mark Corp., 18 Ropes Place, Newark, N. J.*



People who use pecans for profit

**Because:** they're high oil content pecans—bright, full-meated and firm, with the delicate flavor of freshly shelled pecans.

**Because:** every pound of Fleischmann's is a pound of quality pecans, the pick of the pecan meats, rigidly graded to specification.

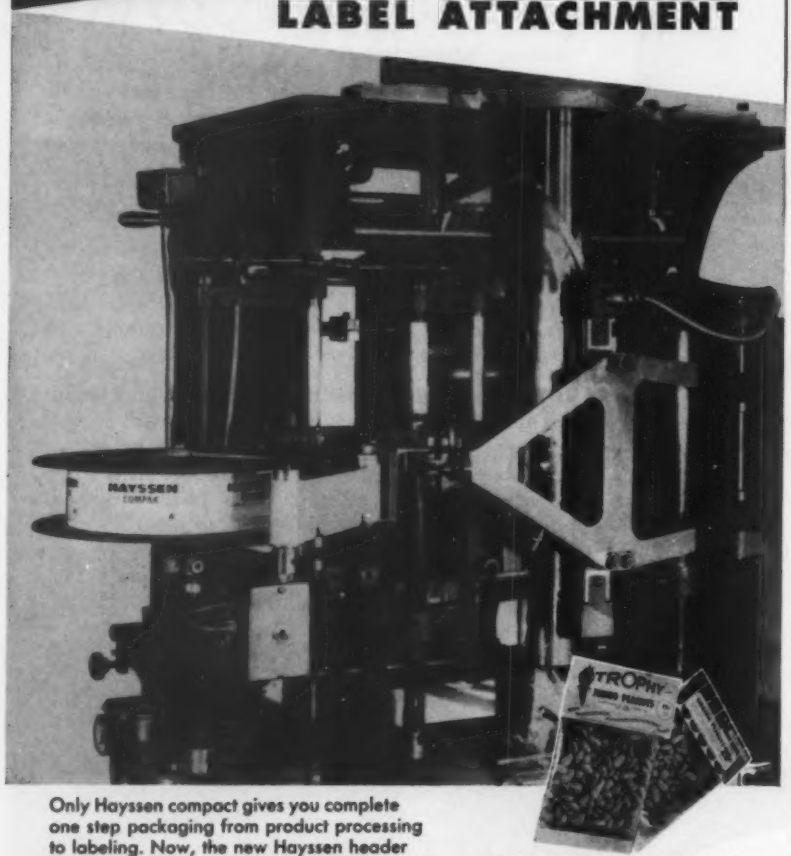
**Because:** they're backed with the kind of service which has earned Standard Brands a prestige reputation in the food field.

specify Fleischmann's *Fancy* Pecans

Standard Brands Incorporated—Branches in All Principal Cities

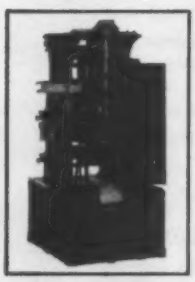
# ELIMINATE YOUR SEPARATE LABELING OPERATION

## USE NEW HEADER LABEL ATTACHMENT




Only Hayssen compact gives you complete one step packaging from product processing to labeling. Now, the new Hayssen header labeler permits you to automatically label as you package, trimming your packaging labor requirements by at least two, helping you maintain high speed production and eliminating side trips to semi-automatic equipment.

*New Hayssen Header Label Attachments are now in use at Kroger Co., Dayton Nut, King Nut and Kar Nut packaging plants.*



**Only Hayssen Compak measures, forms, fills, seals and labels in one operation!**

- End sidetrips to semi-automatic header labelers, save cost of equipment, cut packaging labor requirements.
- Increase production speed — the Hayssen Compak Header label attachment is coordinated to the speed of the Compak to which it is attached. You label at the same high speed at which you package.
- Use roll stock — change labels quickly and easily for new packaging flexibility — attachment completely adjustable to label size. Labels can't curl, double feed.

**first in Automatic Packaging since 1910**

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Confectionery Broker Representing Manufacturing Confectioners Since 1925
Territory: Pennsylvania excluding Philadelphia.

# *NEWSMAKERS*

**Hansella Machinery Corporation** has announced the appointment of **Mr. George B. Hislop** as mid-western sales manager of Hansella and Euromac, Inc. Mr. Hislop served for many years as mid-west representative for Vacuum-Racine and for Charles H. Stehling Co. of Milwaukee as did his father who retired in 1953. He has now severed connections with these firms and Walter H. Kansteiner Co.

**Wm. J. Stange Co.** has made **William Kimball** sales promotion manager. Mr. Kimball has been with the company for twelve years and most recently was sales representative in the New England area.

**Groen Manufacturing Co.** has appointed **Raymond L. McVicar** to the newly created post of director of customer services and has also appointed **Robert F. Groen** eastern sales manager.

**Mr. M. J. Martin** has been elected president of **Penick & Ford, Ltd., Inc.**

**Woodward & Dickerson, Inc.** has announced the appointment of **Mr. H. A. C. Rauchfuss** as chairman of the board and **Mr. C. Earl Gettinger** as president. Woodward & Dickerson deal in cocoa powder, cocoa butter, cake and cocoa waste products.

**Bauer Bros. Co.** has named **Dave Michel** advertising manager of all its divisions. **Jim Hirtzinger** was appointed manager of food machinery sales and **Mar Ginaven** has been made vice president-product research and development. Announcement was also made of the appointment of **E. L. Rastatter** as general sales manager. Mr. Rastatter has been technical director of the company since 1952.

**Arthur J. Nielsen** has been appointed to the technical staff at **Western Condensing Company,** Division of Foremost Dairies. Mr. Nielsen has been with the company since 1956 as a research technician.

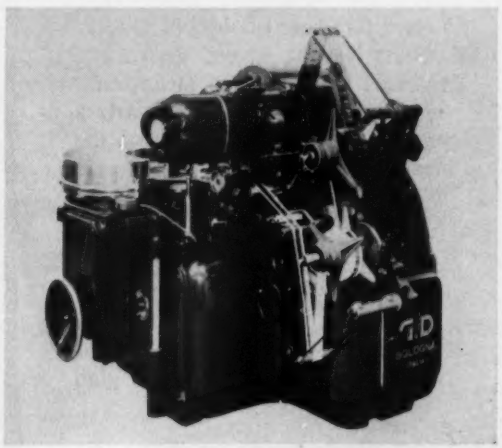
**Dairyland Food Laboratories, Inc.** has appointed **Dr. John Watts, Jr.** to its research department in line with the company's general expansion program. Dr. Watts was formerly with the Nopco Chemical Company where he was a dairy technologist.

**Dodge & Olcott** has presented a plaque and a $1,000 scholarship to Edward Weiss of the Massachusetts Institute of Technology. The scholarship is awarded to encourage outstanding students to take undergraduate work leading to a Bachelor's Degree in Food Technology, Food Engineering or Food Science.

**Seymour Foods, Inc.** has appointed **W. F. Leimert** special consultant. Mr. Leimert recently retired after four years as treasurer and twenty-two years as president of the Tranin Egg Products Company of Kansas City. He will serve Seymour Foods as an account executive and consultant on market and cost analysis.

**Herb Knechtel,** active in the formation of Hickory Bowl Foods of Chicago, is now devoting full time to his work as consultant to the candy industry.

**GD Supermatic**



**MODEL 2500**

**For high-speed twist wrapping of hard form square or rectangular shaped candies**

**Double end twist wrap 400-450 speed range per minute. From 320 to 380 Speed range on bunch fold.**

**SUPERMATIC PACKAGING CORP.**
**979 Lehigh Avenue, Union, New Jersey**
BENEDICT R. MARFUGGI, Vice President Sales Manager

Unique
Flavor of
MOLASSES
Reflects
Bigger Sales

Only quality molasses gives full flavor to Hard Candies, Honeycomb Chips, Chewing Nougat, Kisses, Fudge and Creams . . . and since MOLASSES has been our business for nearly a century, we can assure you of the finest in quality.

Our laboratories are constantly developing new ideas and formulas to help increase your sales. Take advantage of our Technical Service.

If you don't have our booklet—"BASIC CANDY FORMULAS"—we'll be glad to send you a copy, **FREE.**

For prompt, direct delivery, order your molasses requirements from our office nearest you.

Stocks carried at strategic points in the U.S. and Canada.

Packed in 5-, 15-, 30-, and 55-gallon drums.

AMERICAN MOLASSES COMPANY

*Packers of all grades of Molasses and Syrups*

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PLANTS AT Brooklyn, N. Y. • Boston, Mass. • Chicago, Ill.
Los Angeles, Calif. • New Orleans, La. • Wilmington, N. C.
Montreal, Canada

**Walter H. Kansteiner Company,** manufacturers' representatives, have announced that **Mr. Robert J. Brown** has joined their firm. Mr. Brown is a retired Marine Corps Captain.

**J. William Craig,** vice president, director and member of the executive committee of Lamborn & Company, sugar brokers, has retired from the company and has withdrawn as managing partner of Lamborn & Craig & Co. Mr. Craig is a member of the New York Coffee & Sugar Exchange, Inc. and, at one time, served as a member of the board of managers. Mr. Craig will remain in the industry and will announce his future plans shortly.

**The Glassine & Greaseproof Manufacturers Association** has re-elected F. S. Leinbach, president of Riegel Paper Corporation, chairman of the Association for 1960. Guy E. McCorison, president, Thilmany Pulp and Paper Co., was re-named vice-chairman, and Charles H. Leach was re-elected secretary-treasurer of the Association.

**Edward H. Lopez-Miranda** has been elected vice president in charge of the raw sugar department of Lamborn & Co., Inc. it has been announced. **Mr. George Dinkel,** vice president in charge of Lamborn's refined sugar department has been elected to the executive committee. Mr. Dinkel is also a director of the Lamborn Company.

**Packaging Corporation of America** has named **Charles F. Raber** vice-president industrial relations, and **William J. Wakefield** has been appointed vice president in charge of traffic and transportation. Other appointments include **Rowland L. Hall** as director of purchasing and **J. P. Friel** as director of traffic and transportation.

**Atlas Powder Company** has announced the election to its board of directors of **Max E. Colson** and **Edward J. Massaglia.** Mr. Colson has been with Atlas since 1935 in various executive capacities. **Mr. Massaglia** joined Atlas in 1955 from Pfizer International, Inc.

**Clinton Corn Processing Company** has received a 25-year safety plaque from the National Safety Council in recognition of the fact that their control laboratory staff has worked for more than a quarter of a century without an on-the-job accident.

The Chicago office of **Givaudan-Delawanna, Inc.** and its associate companies, Givaudan Flavors, Inc. and Sindar Corp. has been moved to 6778 Northwest Highway, Chicago 31, Illinois.

**Harry P. Cole** has been elected president of **Paper Goods Company, Inc.,** succeeding Edgar E. Abrahams who is retiring. Mr. Cole has been with the firm for forty years and for the past eleven years has been vice president. **Richard A. Cole,** his son, has been elected assistant treasurer of the firm.

*Continued from page 45*

### Code 5B60
### Assorted Chocolates
### 9 ozs.—69¢

(Purchased in a department store, Chicago, Ill.)

**Appearance of Package:** Fair
**Container:** Buff colored tray, printed in brown. Gold foil seal printed in black. Overall cellulose wrapper.
**Number of Pieces:**
**Dark Coated:** 8
**Light Coated:** 8
**Coatings:**
**Colors:** Good
**Gloss:** Good
**Strings:** Good
**Taste:** Good
**Dark Coated Centers:**
**Jelly:** Could not identify flavor, only acid
**Coconut Cream:** Good
**Peanut Brittle:** Good
**Orange Cream:** Weak flavor
**Cordial Pineapple:** Good
**Lemon Cream:** Good
**Molasses Chew:** Good
**Vanilla Cream:** Good
**Light Coated Centers:**
**Chocolate Cream:** Good
**Maple Walnut Cream:** Good
**Raisin Cluster:** Good
**Cashew Cluster:** Good
**Chocolate Cream:** Good
**Raspberry Cream:** Good
**Nut Nougat:** Good
**Cordial Cherries:** Good
**Assortment:** Good
**Remarks:** One of the best packages we have examined in this price field.

---

### Code 5D60
### Milk Chocolate & Peanut Bar
### ⅝ ozs.—3¢

(Purchased in a chain variety store, Chicago, Ill.)

**Appearance of Bar:** Good
**Size:** Good for a 3¢ milk chocolate bar.
**Wrapper:** Outside paper band printed in green. Name in red and white. Inside glassine wrapper.
**Bar:**
**Chocolate:** Good
**Peanuts:** Good
**Remarks:** The best 3¢ chocolate bar we have examined. A good eating chocolate bar at this price.

---

### Code 5G60
### Milk Chocolate Frogs
### 4¼ ozs.—39¢

(Purchased in a department store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Long oblong folding box, one layer type. Yellow paper top printed in red. Imprint of frogs in brown. Cellulose wrapper. 8 pieces.
**Frogs:**
**Milk Chocolate:** Good
**Center:** Chocolate paste
**Color:** Good
**Molding:** Good
**Texture:** Good
**Taste:** Good
**Remarks:** Should be a good novelty for children. Very good eating.

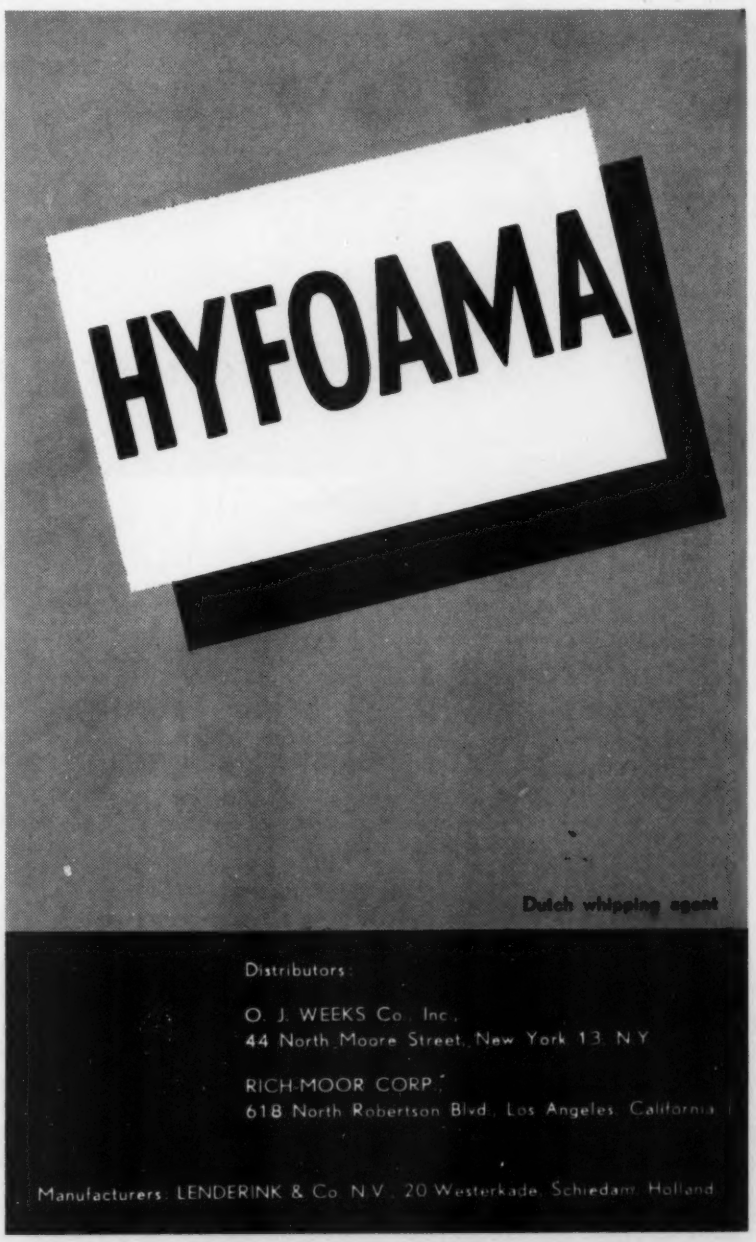
Leading candy manufacturers in 48 countries have found through consistant use that HYFOAMA is the most effective and trouble-free whipping agent for regular production purposes.

Hyfoama D.S. is also preferred because of its cost, since 1 pound of Hyfoama D.S. replaces at least 2 pounds of egg albumen.

HYFOAMA is sold all over the world by giving service to candy manufacturers: working out formulas and production methods on present and new items, giving demonstrations and other types of service; all free of charge.

Technicians from candy factories of many countries come to the candy application laboratory of the Hyfoama factory in Holland where they work out their own problems and new developments.

*Please ask either of our importers, O. J. Weeks or Rich-Moor for samples of Hyfoama, formula booklets and candy samples.*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Manufacturers: LENDERINK & Co. N.V., 20 Westerkade, Schiedam, Holland

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**GENERAL OFFICES**
ST. LOUIS, MISSOURI, 721 Pestalozzi Street

### Code 5A60
### Assorted Chocolates
### 10 ozs.—$1.00

(Purchased in a chain variety store, Chicago, Ill.)

**Appearance of Package:** Good
**Container:** Long oblong shaped box, one layer type. White glazed paper top printed in brown. Cellulose wrapper.
**Appearance of Box on Opening:** Good
**Number of Pieces:**
**Dark Coated:** 19
**Gold Foiled:** 2
**Coating:**
**Color:** Good
**Gloss:** Good
**Strings:** Good
**Taste:** Good
**Centers:**
**Vanilla Marshmallow:** Good
**Vanilla Nut Cream:** Good
**Maple Nut Cream:** Good
**Pink Cream:** Could not identify flavor
**Peanut Cluster:** Good
**Vanilla Caramel:** Good
**Honeycombed Chip:** Good
**Pecan Top Cream:** Good
**Raisin Cluster:** Good
**Lemon Cream:** Not a good lemon flavor
**Orange Jelly:** Good
**Buttercream:** Good
**Hard Candy Ting Ling:** Good
**Foil Wrapped Chocolate Caramels:** Fair
**Assortments:** See remarks
**Remarks:** Assortment is too small. Suggest a few more hard and chewy centers be added to improve the assortment. Suggest some of the flavors be improved.

---

### Code 5E60
### Chocolate Coated
### Raspberry Cream Bar
### 1 oz.—13¢

(Purchased in a department store, Chicago, Ill.)

**Appearance of Bar:** Good
**Size:** Small for this price.
**Wrapper:** Outside paper band printed in maroon, white, red and gold. Imprint of berries in color. Inside wrapper of gold foil.
**Bar:**
**Chocolate:** Good
**Center:**
**Color:** Good
**Texture:** Good
**Taste:** Good
**Remarks:** A very fine eating bar but highly priced at 13¢ for 1 oz.

All subscribers are entitled to send samples of their candy to the Candy Clinic for analysis and report. Address duplicate samples, with approximate retail price, to The Candy Clinic, c/o The Manufacturing Confectioner, 418 N. Austin Blvd., Oak Park, Illinois.

### Code 5C60
### Milk Chocolate Almond Bar
### 1½ ozs.—5¢

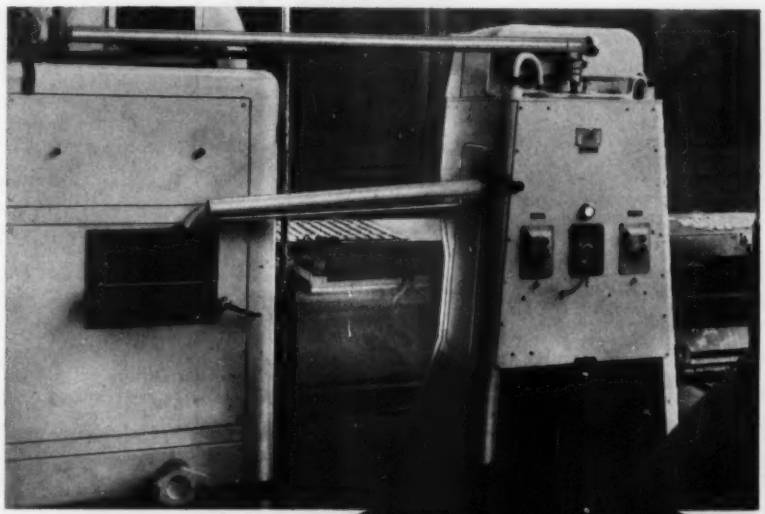
(Purchased in a chain drug store, Chicago, Ill.)

**Appearance of Bar:** Good
**Size:** Good
**Wrapper:** Paper backed foil wrapper. Printed in blue, red and white.
**Bar:**
**Chocolate:** Good
**Almonds:** Good
**Remarks:** A good eating milk chocolate almond bar. Large amount of almonds. Suggest manufacturer check the cost of this bar as there can be very little or no profit at 5¢.

### Code 5F60
### Milk Chocolate Covered
### Chocolate Paste with Pecans
### 1 oz. (2 pieces)—10¢

(Purchased in a chain drug store, Chicago, Ill.)

**Appearance of Bar:** Good
**Wrapper:** Paper backed gold foil wrapper printed in red, white and blue.
**Bar:**
**Chocolate:** Good
**Center:**
**Color:** Good
**Texture:** Good
**Taste:** Good
**Remarks:** The best bar of this kind we have examined this year.

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# Published Just for the Candy Plant

**Confectionery Analysis and Composition**
***by Stroud Jordan and Katheryn E. Langwill***

This volume, first published in 1946, is still the only published reference work on the subject of confectionery analysis. It concerns itself with applicable data that covers composition of basic raw materials as well as that of the finished confections in which they have been employed.
116 pp. – $6.00

**Confectionery Problems**
***(Confectionery Studies, Number 1)***
***by Stroud Jordan***

Stroud Jordan's reputation as an important candy technologist is based on this his first book. Published in 1930 it is still, in many areas, the final word on technology in the industry. Jordan's sense of responsibility to record his discoveries and knowledge for the benefit of the industry caused him to produce more writings on the technical and scientific aspects of candymaking than any other person in the field. The recognition given him in the form of the establishment of the Stroud Jordan Medal by the American Association of Candy Technologists rests on this sense of responsibility.
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**A Textbook on Candy Making**
***by Alfred E. Leighton***

Here is a textbook where the reader can learn the basic fundamentals of candy making, the "how" and "why" of the various operations in non-technical terms. Particular attention is given to the function of raw materials, and why each is included in a formula.
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**Choice Confections**
***by Walter Richmond***

This book, now in its second printing, is written primarily for the manufacturing retailer. It contains 365 formulas given in two batch sizes, one for hand work and one for machine work. All of these formulas have been production tested and have proven to be of great help to manufacturing retailers in varying old items and developing new ones. The book also contains a glossary of candy terms and chemical terms, a complete chapter on chocolate coating methods and a chapter on ingredients and their uses. It is an important and useful book for all manufacturing retailers.
544 pp. – $10.00

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## Two marketing reports available to confectioners

Clinton Corn Processing Company has released a survey of the purchases of candy and chewing gum as reported by the Consumer Panel of J. Walter Thompson Company, Clinton's advertising agency. The survey covers the Panel's purchases in the month of May, 1959 as recorded in a diary by the family. Members of this Panel are chosen to give a good cross section of the United States population (not, however, including Alaska and Hawaii). Of the 4,589 families 84.7% reported making purchases amounting to a total of 20,081 purchases.

The report is quite detailed and contains charts and graphs on how candy and chewing gum is purchased by region, community size, income group and educational level of head of household. Packaging of chocolate and non-chocolate in ounces and packages and percentage of sales of chocolate and non-chocolate candies in variety stores, supermarkets, drug stores, etc. are two other subjects dealt with in the report.

A second booklet of interest to confectioners is DuPont's "Today's Buying Decisions" which deals with supermarket purchases and how they are made. 4,661 shoppers in 225 representative supermarkets (in both city and suburban shopping areas) were interviewed on entering the store as to what they intended to buy and what brand. The same shoppers' actual purchases were checked later but to avoid influencing behaviour they were not informed that this would be done. This survey shows that 91.1% of candy purchases were made as a result of an in-store decision. Of this total 75.8% could be classified as an impulse buy.

The booklet also contains information on what kind of person the average shopper is in terms of age, sex, education, etc. and is an interesting survey of the trends in supermarket selling.

DuPont, in releasing this booklet, made the comment that 22% of all candy sales are made in the supermarket today while fifteen years ago most supermarkets either did not stock candy and chewing gum or relegated it to a tiny corner.

Copies of these booklets are available on request to any manufacturing confectioner interested. For the Clinton survey write to Clinton Corn Processing Company, Clinton, Iowa. For the DuPont report write to: Dept. BH, Film Department, DuPont Company, Wilmington 98, Delaware.

### Code 5K60
### Marshmallow Bunnies
### 1½ ozs.—10¢

(Purchased in a chain variety store, Chicago, Ill.)

**Container:** Tray printed in purple, white and pink. Overall cellulose wrapper.
**Appearance of Package:** Good
**Number of Pieces:** 3
**Bunnies:**
**Color:** Good
**Molding:** Fair
**Texture:** Tough
**Taste:** Fair
**Remarks:** Suggest formula be checked as piece is very tough and lacked flavor.

---

### Code 5I60
### Chocolate Covered Cherries
### 12 ozs.—$1.19

(Purchased in a retail candy shop, New York City.)

**Appearance of Package:** Good
**Container:** Long oblong box, one layer type. Maroon glazed paper top. Imprint of cherries in colors. Rose colored paper wrapper, overall print of name in silver.
**Appearance of Box on opening:** Good. Each cherry is wrapped in printed glassine paper. Crate divider is used.
**Number of Pieces:** 27
**Coating: Milk Chocolate:**
**Color:** Good
**Gloss:** Good
**Strings:** Good
**Taste:** Good
**Center:**
**Cordial:** Very good
**Cherry:** Very good
**Flavor:** Suggest a good cherry flavor be added to improve the flavor.
**Remarks:** The best cordial cherries we have examined in some time.

---

### Code 5H60
### Semi-Sweet Chocolate Covered Peppermint Cream Bar
### 1½ ozs.—10¢

(Purchased in a chain drug store, Chicago, Ill.)

**Appearance of Bar:** Good
**Size:** Good
**Wrapper:** Outside paper band, white printed in brown, white and green. Imprint of bar and center in colors. Inside foil wrapper.
**Bar:**
**Center:**
**Color:** Good
**Texture:** Good
**Flavor:** Good
**Chocolate:** Good
**Remarks:** One of the best chocolate covered cream bars we have examined this year.

---

### Code 4C60
### Assorted Chocolates
### 1 lb.—$1.69

(Purchased in a retail candy shop, New York City.)

**Appearance of Package:** Good
**Container:** Square box, one layer type. Buff glazed paper top. Name embossed in gold. White paper wrapper, overall print of name in blue.
**Appearance of Box on Opening:** Good
**Number of Pieces:** 43
**Nut Crunch:** 2, Cellulose wrappers
**Pralines:** 3
**Jordan Almonds:** 4
**Cordials:** 6, cellulose wrappers
**Coating: Milk Chocolate:**
**Color:** Good
**Gloss:** Good
**Strings:** Good
**Taste:** Good
**Centers:**
**Cordial Pineapple:** Good
**Cordial Cherries:** Good
**Nut Brittle:** Good
**Maple Marshmallow:** Good
**Brazils:** Good
**Nut Nougats:** Good
**Caramallows:** Good
**Buttercreams:** Good
**Pralines:** Good
**Raisin Cluster:** Good
**Jelly:** Could not identify flavor
**Orange Creams:** Good
**Molasses Chew:** Good
**Dates:** Good
**Almonds:** Good
**Peanut Clusters:** Good
**Vanilla Caramel:** Good
**Jordan Almonds:** Good
**Nut Crunch:** Good
**Assortment:** Good
**Remarks:** One of the best assorted chocolates we have examined in some time. Very good workmanship and very good quality.

WHATEVER YOUR CENTER...
A WERMAC MACHINE is the heart of volume production!
Any size, any shape, any center—a WERMAC Candy Machine handles your candy production so smoothly and efficiently you can pack every sweet in every row with minimum cost and maximum profits. And with just a part-time attendant on hand, you can turn out rows of uniform centers automatically!
WERMAC CANDY MACHINES ARE CUSTOM ENGINEERED
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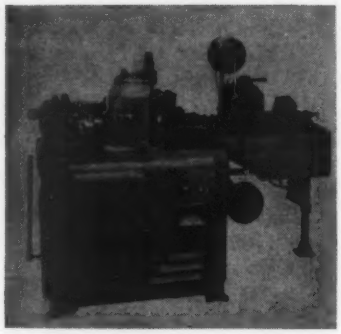
Conservatively, 100 boxes per hour* of 120 count

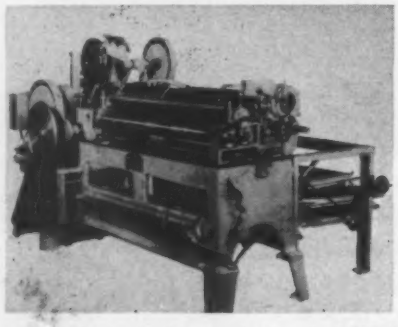
A second Latini unit can be operated by the same person

*based on a 50-minute hour



225 Pops formed and wrapped per minute. No handling between forming and wrapping. Eliminates breakage and labor.

### HOHBERGER BALL MACHINE



Only one operator required to produce up to 1,200 lbs. per hour.

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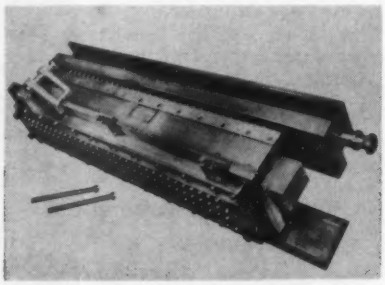

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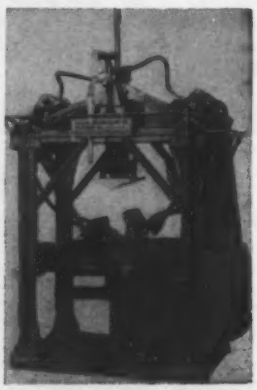
- Special Multi-Row Construction Incorporates Changeable Nozzle Plates.



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- Uniformly incorporates color, flavor and acid
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- Up to 10% scrap may be included

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- All stainless steel construction
- Available in 16-24-32 and 40 inch widths.

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# CALENDAR

May 16; Confectionery Salesmens' Club of Philadelphia, 1:30 P.M. meeting, 2601 Parkway, Philadelphia 30, Pennsylvania.

May 21; Golden West Candy Salesmens' Club, weekend meeting, Carmel Valley Inn, Monterey, California.

May 28; Southwestern Candy Salesmen's Club, luncheon meeting, Sammy's Oak Lawn Restaurant, Dallas, Texas.

May 28; Gopher Candy Club, luncheon meeting 12:30 P.M., Normandy Hotel, Minneapolis, Minn.

June 3; St. Louis Candy Sales Association, 7:30 P.M. Meeting, Congress Hotel, St. Louis, Mo.

June 5-9; Associated Retail Confectioners, convention, Philadelphia, Pennsylvania.

June 5-9; National Confectioners Association, 77th annual convention, Philadelphia, Pennsylvania.

June 6; Denver Mile Hi Candy Club, breakfast meeting, 7:30 A.M., Denver Athletic Club, Denver, Colo.

June 9-12; New York Candy Club & Metropolitan Candy Brokers Assn., 5th annual candy show, Trade Show Building, New York City.

June 10; Los Angeles Confectionery Sales Club, 12:00 noon meeting, Roger Young Auditorium, L. A.

June 11; Carolina Confectionery Salesmen's Club, luncheon meeting, S&W Cafeteria, Charlotte, N. C.

June 11; Kansas City Candy Club, luncheon meeting, Town House Hotel, Kansas City, Kansas.

June 23; Confectionery Salesmen's Club of Baltimore, stag outing, Turf Valley Club, Ellicott City, Md.

July 10-13; SWTCA, convention, Dinkler Plaza Hotel, Atlanta, Ga.

July 21; Empire State Candy Club, clam bake, Hinerwadel's Grove, North Syracuse, New York.

July 30-August 4, NCWA, 1960 convention, Sheraton-Park Hotel, Washington, D. C.

July 30; August 3; 4th Annual International Specialty Food and Confection Show, Congress Hotel, Chicago, Illinois.

September 4-6; 3rd Annual International Confectionery Show, Parc des Expositions, Paris, France.


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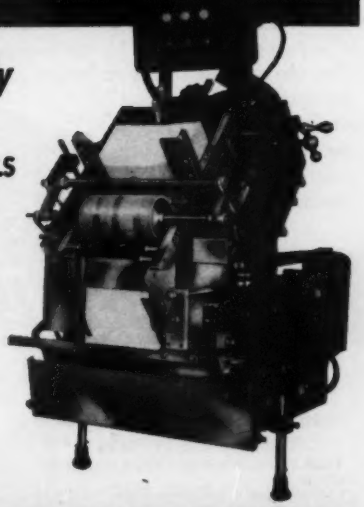

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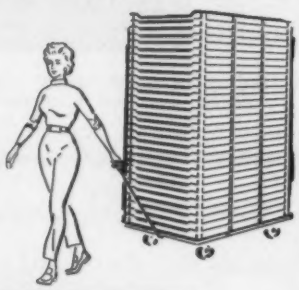

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Over 300 Stehling mixers in daily use attest to the wide acceptance of this fine machine for the manufacture and use of coatings. Their rugged construction, superior mixing action, and efficient operation have made "Stehling" a by-word in the industry.

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Dear Mr. Greenberg:

We wish to express our complete satisfaction with the staggered six-row pump bar, which we recently purchased from you.

A 97% increase in spice drop production, at a slower depositor speed, without additional help, starch trays or floor space, fulfills the promises you made before the installation.

We greatly appreciate your guidance, service and cooperation.

Yours very truly,
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- No extra starch!
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| | FORMER PUMP BAR | NEW STAGGERED ROW PUMP BAR |
|---|---|---|
| Type of Pump Bar | 3 Row Straight 30 Piston Pump | 6 Row Staggered Row Pump Bar (40 and 39 piston in alternate rows |
| Deposits per tray | 4 | 3 |
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| Pieces per tray | 360 | 711 |
| Increase in number of pieces per tray | — | 351 |
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Let us translate your savings into dollars. If you c accomplish approximately double production with the n Staggered Row Pump Bar, then, you save the full cost o Mogul crew and the space and use of the complete Mogul li and equipment. This amounts to no less than $500 savi every two weeks or $1,000 per month. We arrive at this fig by calculating a saving of $300 every two weeks which is t pay for a three-man crew and, $200 for the operating c of the floor space of the Mogul, trays and auxiliary eq ment, also cost of breakage of trays, cost of power, ste maintenance, etc. So, you can see that from the day y install the Staggered Row Pump Bar, you can have a savi of $1,000 per month.

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Chicago, Illinois

# Helpful Books for Candy Plant Executives

## Confectionery Analysis and Composition
***by Stroud Jordan and Katheryn E. Langwill***

This volume, first published in 1946, is still the only published reference work on the subject of confectionery analysis. It concerns itself with applicable data that covers composition of basic raw materials as well as that of the finished confections in which they have been employed.
116 pp. – $6.00

## Confectionery Problems
***(Confectionery Studies, Number 1)***
***by Stroud Jordan***

Stroud Jordan's reputation as an important candy technologist is based on this his first book. Published in 1930 it is still, in many areas, the final word on technology in the industry. Jordan's sense of responsibility to record his discoveries and knowledge for the benefit of the industry caused him to produce more writings on the technical and scientific aspects of candymaking than any other person in the field. The recognition given him in the form of the establishment of the Stroud Jordan Medal by the American Association of Candy Technologists rests on this sense of responsibility.
347 pp. – $6.00

## A Textbook on Candy Making
***by Alfred E. Leighton***

Here is a textbook where the reader can learn the basic fundamentals of candy making, the "how" and "why" of the various operations in non-technical terms. Particular attention is given to the function of raw materials, and why each is included in a formula.
175 pp. – $6.00

## Choice Confections
***by Walter Richmond***

This book, now in its second printing, is written primarily for the manufacturing retailer. It contains 365 formulas given in two batch sizes, one for hand work and one for machine work. All of these formulas have been production tested and have proven to be of great help to manufacturing retailers in varying old items and developing new ones. The book also contains a glossary of candy terms and chemical terms, a complete chapter on chocolate coating methods and a chapter on ingredients and their uses. It is an important and useful book for all manufacturing retailers.
544 pp. – $10.00

## Your Future Factory
***by V. P. Victor, M.E., P.E.***

A twenty page booklet contains the essentials of modern factory planning. It includes plant layout, process design, materials handling, building and structure, production line and financial planning. This is a reprint of the five part article which appeared in The Manufacturing Confectioner in 1958. Mr. Victor is well qualified to advise on factory layout since he has had considerable experience in such planning together with experience in design of candy machinery and process development. He is a consulting engineer with headquarters in New York City.
20 pp. – $2.00

## Profits Through Cost Control
***by Frank Buese and Eric Weissenburger***

This material deals with the problems of cost control in candy plants including planning for profit. The emphasis is on planning operations so that a profit will be made, and in early detection of those factors which will adversely affect profit.
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## How to Salvage Scrap Candy
***by Wesley H. Childs***

This booklet is a complete revision of the author's work "Modern Methods of Candy Scrap Recovery" published in 1943. A considerable amount of information has been collected since that time on methods and techniques of salvaging scrap candy. This booklet covers all types of candy, and gives many practical and economical ways of converting scrap candy into a useful form for re-use.
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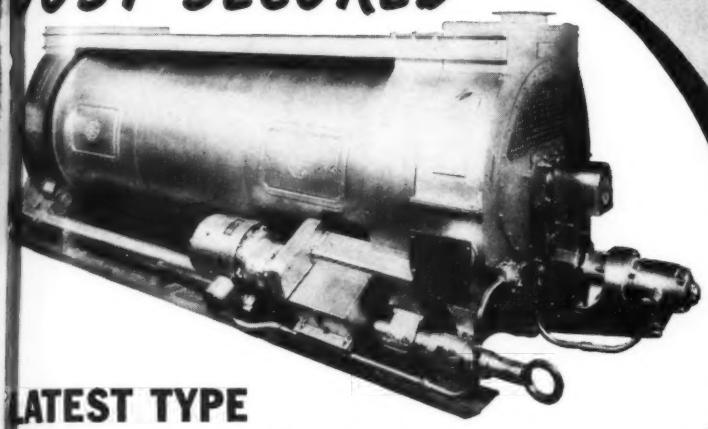

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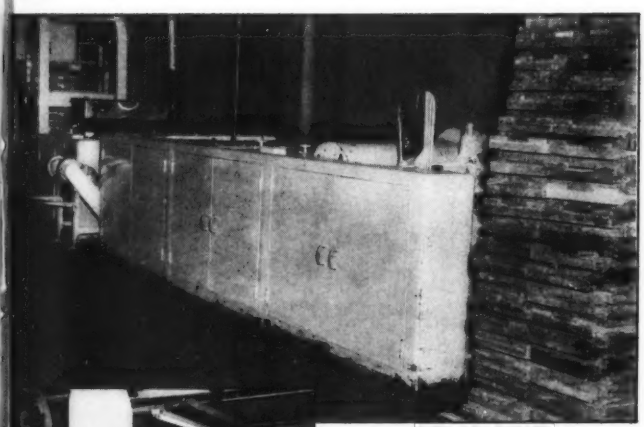

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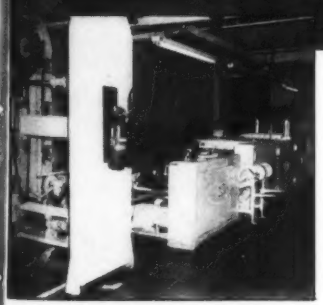

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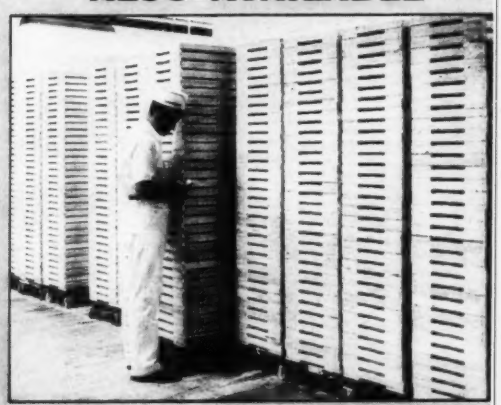

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